Five-Year Review Report

First Five-Year Review Report

for

ChemCentral Site

Wyoming
Kent County, Michigan

November 2004

PREPARED BY:

United States Environmental Protection Agency
Region 5
Chicago, Illinois

Approved by:

for Richard C. Karl, Director
Superfund Division
U.S. EPA

Date: 16 Nov 04

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Attachments

List of Acronyms

ARAR	Applicable or relevant and approriate requirement
CERCLA	Comprehensive Environmental Response Compensation Liability Act
CIC	Community Involvement Coordinator
CVA	Carbon Vapor Adsorption
EPA	Environmental Protection Agency
GSI	Groundwater/Surface Water Interface
MCL	Maximum Contaminant Level
MDEQ	Michigan Department of Environmental Quality
mg/kg	Milligram Per Kilogram
NCP	National Contingency Plan
NPL	National Priorities List
PCB	Polychlorinated Biphenyls
PCE	Perchloroethylene
POTW	Publicly Owned Treatment Works
ppb	Parts Per Billion
ppm	Parts Per Million
PRP	Potentially Responsible Party
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Chemical
TCA	Trichloroethane
TCE	Trichloroethylene
UAO	Unilateral Administrative Order
VOC	Volatile Organic Chemical

Executive Summary

The remedy for the ChemCentral Site, located in Wyoming, Michigan included the following components:

- Continue operation of the existing groundwater collection and treatment system;
- Install and operate a soil vaport extraction (SVE) system for soils on-property as well as two off-property locations just north of the property;
- Install and operate a purge well at the deep lens of a contaminated groundwater location and hook this well into the current groundwater collection and treatment system;
- Collect oil accumulating in the purge wells and dispose of the oil at an off-site facility in accordance with applicable federal and state regulations;
- Install and operate an expansion of the current off-property groundwater collection system, by either extending the interceptor trench or installing additional purge wells;
- Impose institutional controls, such as deed restrictions to prohibit the installation of water wells in the site area and any future development that might disturb contaminated soils; and
- Implement a groundwater monitoring program capable of demonstrating the effectiveness of the groundwater capture system and that the groundwater treatment technology is achieving the cleanup standards.

The site achieved construction completion with the signing of the Preliminary Closeout Report on September 19, 1995. The trigger action for this five-year review was the completion date for the first five-year review, November 16, 1999.

The remedy at the ChemCentral Site currently protects human health and the environment because the groundwater collection and treatment system, the soil vapor extraction system, and groundwater monitoring program protect human health and the environment in the short term. However, in order for the remedy to be protective in the long-term, institutional controls need to be put in place to prevent exposure to contaminated groundwater and soils.

Five-Year Review Summary Form, cont'd.

Issues:

1) Deed restriction are not in place on all of the parcels of property downgradient of the facility;
2) Insulation on air stripper tower needs repair;
3) The location and condition of all wells not found during the inspection need to be verified;
4) All wells should be marked with a permanent identification plates;
5) Well guard at SCH-2 requires repair;
6) MW-52 riser needs repair;
7) Consider Amending ROD to eliminate requirement for collection trench extension;
8) Consider the need to rehabilitate/redevelop some monitoring wells; and,
9) Identify and properly abandon any wells no longer in use.

Recommendations and Follow-up Actions:

1) U.S. EPA will work with ChemCentral to contact the owners of the parcels to get the required deed restrictions fully in place;
2) ChemCentral will make repairs to the tower insulation and wells as needed;
3) ChemCentral will verify location of all wells during the next monitoring well sampling;
4) ChemCentral will place permanent well markers on all monitoring wells;
5) ChemCentral will repair SCH-2 well guard;
6) ChemCentral will repair MW-52 riser;
7) EPA, in consultation with MDEQ will consider whether a proposal to amend the ROD is appropriate;
8) EPA will work with ChemCentral and MDEQ to evaluate the need to rehabilitate/redevelop the monitoring wells;, and,
9) ChemCentral will identify any wells no longer in use or necessary for the remedy. ChemCentral will properly abandon such wells.

Protectiveness Statement:

The remedy at the ChemCentral Site currently protects human health and the environment because the groundwater collection and treatment system, the soil vapor extraction system, and groundwater monitoring program protect human health and the environment in the short term. However, in order for the remedy to be protective in the long-term, institutional controls need to be put in place to prevent exposure to contaminated groundwater and soils.

Other Comments:

None

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name *(from WasteLAN)*: ChemCentral.

EPA ID *(from WasteLAN)*: *MID980477079*

Region: 5	**State:** MI	**City/County:** Wyoming, Kent County

SITE STATUS

NPL status: X Final ☐ Deleted ☐ Other (specify) _____

Remediation status (choose all that apply): ☐ Under Construction X Operating ☐ Complete

Multiple OUs?* ☐ YES X NO	**Construction completion date:** 09/19/1995

Has site been put into reuse? X YES ☐ NO

REVIEW STATUS

Lead agency: X EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author name: Timothy J. Prendiville

Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA

Review period:** 06/15/2004 to 11/15/2004

Date(s) of site inspection: 09/21/04

Type of review:

X Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion

Review number: ☐ 1 (first) X 2 (second) ☐ 3 (third) ☐ Other (specify) _____

Triggering action:

☐ Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU#____
☐ Construction Completion X Previous Five-Year Review Report
☐ Other (specify) _____

Triggering action date *(from WasteLAN)*: 11/16/1999

Due date *(five years after triggering action date)*: 11/16/2004

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Report

I. Introduction

The purpose of five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and recommendations to address them.

The Agency is preparing this five-year review pursuant to the CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The agency interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA) Region 5 has conducted a five-year review of the remedial actions implemented at the ChemCentral Site, located in Wyoming, Kent County, Michigan. This review was conducted by the Remedial Project Manager (RPM) from June 15, 2004 through September 30, 2004. This report documents the results of the review.

This is the second five-year review for the ChemCentral Site. The triggering action for this statutory review is the completion date for the first five-year review as shown in U.S. EPA's WasteLAN database: November 16, 1999. This review is required because certain response actions are ongoing and hazardous substances, pollutants, or contaminants are or will be left on site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Leak from Construction Error	**1957-1962**
Site Discovery	**1977**
Kent County Court Order to Install Groundwater Collection System and Air Stripper	**May 1984**
Purge Wells Installed	**Fall 1984**
Air Stripper Begins Operation	**December 1984**
Kent County Order to Remediate 28th Street Ditch	**May 1985**
Under Drain Installed and Operating	**1986-1987**
Groundwater Remediation System Operating	**September 1985**
28th Street Ditch Remediation Complete	**November 1985**
NPL listing	**1987**
Remedial Investigation/Feasibility Study	**August 1988 - January 1989**
ROD signature	**September 30, 1991**
Unilateral Administrative Order(RD/RA)	**March 31, 1992**
Remedial Design Start	**April 7, 1992**
PRP Remedial Action Start	**August 18, 1994**
Construction Completion Date	**September 19, 1995**
SVE System Operating	**1996**
Plume Dynamics and GSI Monitoring Program Approved	**June 1, 1999**
First Five-Year Review	**November 16, 1999**

III. Background

Site Characteristics

The Site encompasses a 2-acre parcel of land owned by the ChemCentral Corporation, a rectangular parcel owned by Consumers Power extending north from the ChemCentral property with the approximate dimensions of 1,800 feet in length by 300 feet wide, Cole Drain which is a small urban creek flowing in a northerly direction and is located along the Site's western boundary, and any property beyond the ChemCentral property boundaries where hazardous substances have come to be located. Hazardous waste has been identified in the soil and/or groundwater of nine (9) properties beyond the boundaries of the ChemCentral property. Cole Drain enters Plaster Creek at a confluence approximately 2,500 feet north of the Site.

Land and Resource Use

The Site is situated in a mixed residential and commercial section of the City of Wyoming that includes small industrial facilities. The City of Wyoming is a suburb of Grand Rapids which is located in west-central Michigan, approximately 25 miles east of Lake Michigan in Kent County. There are approximately 10,000 people living within one mile of the Site. The Site is bordered by US 131 South, Cole Drain, a Consumer Powers substation, and several small industries (see Attachment 1). The nearest residences to the Site are located approximately 500 feet west of the property boundary. The residential areas primarily consist of single family homes. There are two hotels located within approximately 800 feet of the Site.

The subsurface geology of the Site consists of a glacial sand deposit averaging approximately 30 feet in depth. Underlying the sand unit is a low permeability clay layer which possibly acts as an aquiclude to the migration of groundwater from the upper sand unit down to the underlying bedrock. The bedrock is comprised of gypsum and shales. The clay layer does contain small lenses of sand and gravel, but these lenses are not hydraulically connected to the upper sand aquifer. Groundwater flow in the area is south to north. The nearest public well to the Site is located approximately 1.5 miles south of the property. An industrial well is located approximately 500 feet south of the Site.

History of Contamination

Between 1957 and 1962 hazardous substances entered the ground at the Site through a construction error in a T-arm pipe used to transfer liquid products from bulk storage tanks to small delivery trucks. After losses in chemical inventories were noted, the construction flaw was discovered and then repaired. It is also possible that additional hazardous substances entered the ground through accidental spills.

Initial Response and Basis for Taking Action

In July 1977, a routine biological survey of Plaster Creek resulted in the discovery of a contaminated ditch draining into Cole Drain. This ditch was located immediately north of 28th Street and north of the ChemCentral property. The ditch contained oils and concentrations of polychlorinated biphenyls (PCBs) and metals in the low parts per million range. In December 1982 the property was proposed for inclusion on the National Priorities List (NPL) and finalized on the list in 1987. The Remedial Investigation (RI) was conducted by the potentially responsible party (PRP) between August 1988 and January 1989.

Soils

In October 1978, the Michigan Department of Environmental Quality (MDEQ) and U.S. EPA sampled six locations at or near the water table immediately north, east and south of the ChemCentral facility and found impacts of phthalates, substituted benzenes, naphthalenes, octyl ketone, and PCBs, with the highest concentrations north of the facility. Samples taken in May 1979 found the same results. Two soil samples taken by the MDEQ in December 1979 south of ChemCentral showed impacts from PCBs and traces of carbon tetrachloride and chloroform.

In 1982, the PRPs tested soils from boring south of the 28th Street ditch, south of 28th Street, and south of the Consumer Power substation and found PCBs. In 1983, PCBs were detected in three soil borings a small distance north of the facility as well as in sediments from the bottom of the 28th Street Ditch. The ditch sediments also contained other organic and metal contaminants. In 1984, as part of a Kent County Circuit Court order, soil borings were drilled near the ChemCentral facility which revealed that shallow soils were impacted with volatile organic contaminants (VOCs), particularly 1,1,1,2-tetrachloroethane (PCE), toluene, and 1,1,2-trichloroethane (TCA) on the west and north side of the facility.

The RI showed that soils at the Site contain approximately twenty-two different organic compounds at concentrations above background soil levels, including low levels of PCBs. Two source areas were identified in the capillary zone immediately to the west and north of the facility. Low concentrations of contamination above the capillary zone in soils immediately north of the facility and extending north to 28th Street were detected. Sediment samples from Cole Drain indicated that low levels of a few organic compounds were present but at concentrations no greater than those measured in upstream sediment samples.

Groundwater

In May 1979, the MDEQ installed 9 monitoring wells around the ChemCentral property and subsequently detected organic contaminants north of the property and in Cole Drain. PCBs were also detected north of the property. An August 1979 sampling event discovered oils and VOCs in samples north of the property. PCBs and phenol were detected north of the Consumers Power substation. Phenol was also discovered to the east of the ChemCentral property. In 1980

the PRPs analyzed groundwater from 15 new wells which indicated low PCB levels south of 28th Street and phenol to the north of the facility. In August 1982, various organic contaminants were detected immediately north of the ChemCentral property. VOCs were also detected in a well located east of the facility. In addition, traces of phthalates were detected in Cole Drain and chlordane was detected south of the facility.

In 1983, a hydrogeologic study by the PRPs revealed a VOC plume extending south to north from the ChemCentral property to 28th Street. Toluene, 1,1,1-trichloroethane (TCA) and TCE were the most commonly detected VOCs. The highest concentrations of VOCs were found in the upper part of the saturated zone. PCBs and pesticides were not detected in the groundwater, however, several metals were detected at low concentrations and total phenols were present in the same area as the VOC plume. In response to the 1984 Circuit Court Order, the PRPs investigated deeper groundwater below the clay confining layer. Isolated groundwater below the clay layer in the northwest corner of the Site was found to contain various VOCs. Also, as part of the Circuit Court Order, the PRPs investigated groundwater contamination north of 28th Street in 1984 and 1985. The data indicated that there was a VOC plume moving north under 28th Street, slowly bending to the west and entering Cole Drain between Terminal and Mart Streets. The VOCs detected were primarily chlorinated compounds.

The RI groundwater investigation found the site groundwater to contain approximately thirty-five different orgainic compounds. Low concentrations of chlorinated compounds were detected upgradient of the property, originating from a source other than ChemCentral. Groundwater contamination was detected in a plume extending north of the property downgradient to Cole Drain near Mart Street. Contaminated groundwater is not flowing into Cole Drain based on results of surface water samples collected from Cole Drain. No Groundwater contamination was detected west of Cole Drain, downgradient of the Site.

Surface Water

Sampling of the 28th Street ditch in August 1982 identified PCBs in the surface water of the ditch. The 1983 hydrogeologic study found various VOCs in the surface water from the 28th Street ditch. The 1988-89 RI found that there were no semi-volatile organic contaminants (SVOCs) and only one VOC detected in Cole Drain surface water indicating no contaminant contributions from the Site.

IV. Remedial Actions

Pre-ROD Actions Taken

In May 1984, the Kent County Circuit Court ordered ChemC entral to install a groundwater collection and air stripping system. On August 7, 1984 ChemCentral hired EDI to install and start up a groundwater collection system and an AquaDetox air stripping system. Three purge wells and connecting piping were installed between ChemCentral and 28th Street in

the fall of 1984. Prior to entering the air stripper, the water passes through an oil/water separator to skim off any floating oils. The stripping tower was installed in the fall and began operation late in December 1984. The contaminated stripping air is passed through a steam-regenerative activated carbon system having about 90% efficiency in the removal of total contaminants from the air. Waste solvents collected in the steam condensate are drummed and disposed off-site. The air stripping system discharges treated groundwater into the City of Wyoming's wastewater treatment system. Effluent from the stripping system is regularly monitored to assure compliance with limits set by an agreement with the City. Air emissions testing of the air stripping system is also performed on a regular basis.

An underdrain system was installed near, and roughly parallel to, Cole Drain in November and December 1986. The purpose of this drain is to collect contaminated groundwater and prevent it from entering Cole Drain. Water collected in the drain is pumped back to the stripping tower. After stripping the water is discharged to the City of Wyoming's sewer system. The underdrain consists of about 1,000 feet of four-inch perforated pipe placed in gravel filled trenches extending from 28th Street northward. Collected water flows north to the pumping station from which it is pumped back to the air stripper. The underdrain has been in operation since April 1987.

The May 1984 Kent County Circuit Court Order also directed ChemCentral to excavate and dispose of water, soil, and sediment from the 28th Street ditch. Installation was completed, and operations began, of a well point system for dewatering the ditch in November 1985. In December 1985 approximately 550 cubic yards of soil with PCB concentrations less than 50 parts per million (ppm) were taken to an off-site disposal facility. One hundred-twenty cubic yards of soils (80 cubic yards with PCBs greater than 50 ppm and 40 cubic yards with PCBs less than 50 ppm) were disposed of at a TSCA landfill.

Record of Decision

Based on the findings of the RI and Baseline Risk Assessment, a Feasibility Study (FS) was conducted to identify and evaluate different cleanup options. The FS was completed on June 21, 1991. The U.S. EPA then issued a Record of Decision on September 30, 1991, that called for the following actions.

- Continue operation of the existing groundwater collection and treatment system until groundwater cleanup standards are achieved and maintained;

- Install and operate a soil vapor extraction (SVE) system for soils on-property as well as two off-property locations just north of the property;

- Install and operate a purge well at the deep lens of a contaminated groundwater location and hook this well into the current groundwater collection and treatment system;

- Collect oil accumulating in the purge wells and dispose of the oil at an off-site facility in accordance with applicable federal and state regulations;

- Install and operate an expansion of the current off-property groundwater collection system, by either extending the interceptor trench or installing additional purge wells;

- Impose institutional controls, such as deed restrictions to prohibit the installation of water wells in the site area and any future development that might disturb contaminated soils; and

- Implement a groundwater monitoring program capable of demonstrating the effectiveness of the groundwater capture system and that the groundwater treatment technology is achieving the cleanup standards.

Unilateral Administrative Order

On March 31, 1992, U.S. EPA issued a final Unilateral Administrative Order (UAO) to the ChemCentral Corporation. The UAO required ChemCentral to perform a remedial design (RD) for the remedy described in the Record of Decision (ROD) and to implement the design by performing the remedial action (RA). The effective date of the UAO was April 7, 1992.

Remedy Implementation

Remedial Actions

Soil Vapor Extraction System

Between 1994 and 1996, an SVE system was designed and constructed at the ChemCentral Site in accordance with the ROD for treatment of the soils. Four extraction wells were installed immediately to the west and north of the ChemCentral building to remediate on-property soils, and two extraction wells were installed north of the ChemCentral property on the Consumers Power property to treat off-property soils. The extraction system is designed to treat approximately 300 cfm of air. The extracted soil vapors are sent through a steam-regenerative activated carbon system used for the air stripping system and treated air is vented to the atmosphere. A condensate pump transfers water collected in the knock-out vessel to the air stripping tower feed tank to treat the condensate in the air stripping system. To optimize the air flow through the soils on-property and to protect the extraction wells from damage due to truck traffic, the on-property soils were paved over with concrete. The SVE system was first operated intermittently in August 1995 and January 1996. Full time operation began in March 1996. Flow and VOC concentrations of the vapor stream are monitored on a semi-annual basis. Treated effluent from the air stripping system and the discharge from the air/vapor collection system are monitored on a regular basis for compliance with applicable regulations. Table 2

presents the total pounds of contaminants removed by the SVE system between 1985 and 2003. Between August and November of 1996, a six month SVE system performance evaluation was performed. At the time of the evaluation, only PCE and bis(2-ethylhexyl)phthalate were observed in concentrations exceeding the ROD cleanup standards. In accordance with the RD/RA work plan ChemCentral is only required to do further compliance monitoring when it plans to petition U.S. EPA to shut down the SVE system. No petition has yet been made to U.S. EPA.

Groundwater Extraction/Treatment System

An AquaDetox® air stripping system was installed in the fall of 1984 and began operations in December 1984. The stripping tower removes contaminants from the groundwater to air. The contaminated air is passed through a steam-regenerative carbon vapor adsorption (CVA) system having about 90% efficiency in the removal of total contaminants from the air. Waste solvents collected in the CVA system are drummed and disposed of properly. Treated water discharges from the stripping tower to the City of Wyoming's Clean Water Plant.

Contaminated groundwater is pumped from three purge wells (PW-1, PW-2 and PW-3) from the plume to the north of ChemCentral to the stripping tower for treatment through underground transmission piping. The purge wells are capable of producing an approximate combined flow rate of 90 gallons per minute (gpm). The water flows through an oil/water separator (OWS) before entering the stripping tower. The OWS removes floating oil from the groundwater. The small amount of oil is managed as waste.

Flow from another purge well, SCH-2, also discharges to the stripping tower. SCH-2 is a modified monitoring well. The flow from SCH-2 is very small compared to the flow from the other wells. Operation of SCH-2 as a purge well began in April 1996.

An underdrain system, referred to as the North Underdrain or PW-4, was installed next to and roughly parallel to Cole Drain in November and December 1986. The underdrain began operating in April 1987. The underdrain collects groundwater and prevents it from entering Cole Drain. The underdrain consists of about 1,000 feet of four-inch perforated pipe placed in a gravel-filled trench extending from 28th Street northward. Collected water flows north to a pumping station from which it is pumped back to the air stripping tower for treatment and discharge to the City. The average flow rate from PW-4 is approximately 30 gpm.

The groundwater treatment system began operation in September 1985. The PRPs have continued to operate and monitor the system since then. Table 2 presents the total pounds of contaminants removed by the groundwater extraction system between 1985 and 2003.

Table 2 Total Pounds of Contaminants Recovered by SVE System and Purge Wells (1985-2003)			
Chemical	**SVE**	**Purge Wells**	**Purge Well and SVE**
1,1,1-Trichloroethane	1200.15	6850.63	8050.78
1,2-Dichloroethene	876.72	7530.75	8416.47
Ethylbenzene	76.67	1914.38	1991.04
Toluene	501.51	13405.11	13906.62
Trichlorothene	78.81	1102.93	1181.75
Vinyl Chloride	0.00*	1244.91	1244.91
Xylene	115.12	5944.52	6059.65
Tetrachloroethene	379.23	607.01	986.24
Naphthalene	4.29	10.99	15.29

*Vinyl chloride is not an analyte for the SVE system

Trench Extension/Groundwater Monitoring

The 1991 ROD called for an expansion of the current off-property groundwater collection system (the north underdrain interceptor trench) on the north end to capture the contaminant plume before it enters Cole Drain. To date the extension has not been constructed. The PRPs completed the design of the extension in 1994. In 1995, the State of Michigan passed several amendments to Part 201 of the Natural Resources and Environmental Protection Act (formerly the Michigan Environmental Response Act, or Act 307). In June 1996, the PRPs petitioned U.S. EPA to change the groundwater cleanup standards established in the ROD to those based on the foreseeable uses and exposure controls. The Part 201 amendments allow for the use of a mixing zone for calculating the potential impacts of groundwater venting to surface water. The PRPs have begun implementing a Plume Dynamics/Groundwater Surface Water Interface (GSI) monitoring program. The program was developed to provide a comprehensive monitoring of the groundwater plume. Data from the program has been used to establish a baseline of data for the plume. The data will be used to determine the necessity of the trench extension, or other modifications to the remedy, including changing the cleanup standards to the current Part 201 standards. No one is currently using the groundwater north of the ChemCentral property.

Institutional Controls

The 1991 ROD required that institutional controls, such as deed restrictions to prohibit the installation of water wells in the area, and any future development that might disturb

contaminated soils, be imposed at the Site. The UAO required ChemCentral to survey the Site to determine the exact legal descriptionof the properties impacted by the deed restrictions in Appendix IV to the UAO, and then incorporate those legal descriptions into the deed restrictions required by the UAO. No one is currently using groundwater downgradient of the Site. One commercial well is located at the C.D. Osborn facility which is sidegradient to the site.

The Site includes nine (9) downgradient properties where the contaminated groundwater plume has extended. Each of the nine downgradient properties have had deed notices filed in the chain of title along with an Acknowledgment of Deed Restrictions (Attachment 10), providing for the property owner's signature acknowledging that the restrictions were placed on the properties. Although each of the owners of the downgradient properties have received notice of the need for deed restrictions restricting the use of groundwater, ChemCentral has been able to get signed acknowledgments of restrictions from only three of the owners for parcels 2, 3 and 6. ChemCentral is still pursuing the purchase of parcel 1. The remaining parcels require further negotiations with the property owners before acknowledgments will be obtained. U.S. EPA will conduct further legal review of the deed restrictions and acknowledgments of restrictions to determine whether they are sufficient, or whether new restrictions are necessary.

Operation and Maintenance

Remedial Design and Remedial Action construction activities at the Site were conducted by ChemCentral and its contractors. The components of the remedial action were constructed by contractors and sub-contractors to ChemCentral. All design plans, and field activities were reviewed and approved by U.S. EPA, in consultation with MDEQ, to ensure consistency with the ROD, the RD, and RA work plans, and federal and state requirements.
N

The design and construction quality assurance/quality control (QA/QC) program utilized throughout the Remedial Design/Remedial Action (RD/RA) was in accordance with U.S. EPA protocols. Details of the analytical procedures used to ensure the quality of work are contained in the approved Quality Assurance Project Plan (QAPP) sections of the Remedial Design/Remedial Action Work Plan. The QA/QC program utilized has been sufficient to allow U.S. EPA to make the determination that all reported materials specifications are adequate and construction methods used allowed remedy construction to be satisfactorily performed in accordance with the ROD. The groundwater/surface water monitoring activities have been conducted in accordance with the approved QAPP.

Monitoring Program

Groundwater extraction and treatment will be required until it has been demonstrated that groundwater cleanup standards have been attained. Until that time monitoring of the groundwater and the treatment system will also be required. As part of the requirements of the 1984 Kent County Circuit Court Order, ChemCentral has been performing quarterly groundwater monitoring. That monitoring continues today. U.S. EPA, in consultation with the MDEQ, will certify completion of the groundwater remediation activities once it has been determined that cleanup levels have been attained and maintained for all chemicals of concern listed in the ROD.

As discussed above, the U.S. EPA and MDEQ have worked with ChemCentral to expand the current monitoring network to better monitor the plume dynamics and to ascertain whether surface water criteria in Cole Drain might be exceeded if the trench extension is not constructed. Site monitoring is now performed in accordance with the June 1, 1999, "Plume Dynamics and GSI Groundwater Monitoring Program". Data from that monitoring program are discussed below.

Each of the components of the treatment system (purge wells, north underdrain, air stripping tower, SVE system, carbon vapor adsorption system) also require periodic monitoring. On a quarterly basis effluent to the City of Wyoming publicly owned treatment works (POTW) is monitored to ensure compliance with the industrial users permit. Monthly air sampling is required for the air stripping tower as required by the MDEQ Air Quality Substantive Requirement Document. In addition, daily system checks are performed by ChemCentral personnel and meter readings from the equipment are taken on alternate days.

V. Progress Since the Last Review

This is the second Five-Year Review for the ChemCentral Site. The first Five-Year Review, signed November 16, 1999, made the following recommendations,:

1) The system continue to be operated as designed until final groundwater cleanup levels, as set forth in the ROD, are achieved;

2) Groundwater studies be completed to determine whether modifications to the groundwater extraction system are necessary to ensure the system adequately captures the plume, and to determine the fate of any contaminants not currently being captured.

3) A final long-term groundwater monitoring should be put in place taking into consideration the results of the additional groundwater studies and any modifications to the remedy.

4) Additional efforts should be made by the PRPs, and/or U.S. EPA to put groundwater use restrictions on those properties which do not already have them in place, as required by the ROD.

Since the November 16, 1999, Five-Year Review for the Site, the PRPs have continued to operate and monitor the SVE and groundwater treatment systems. In addition to continuing groundwater monitoring in accordance with the Kent County Court order, ChemCentral finalized and began implementing a long-term groundwater monitoring plan; the June 1, 1999 "Plume Dynamics and GSI Groundwater Monitoring Program.

In June 1996, the PRPs petitioned U.S. EPA to change the groundwater cleanup standards established in the ROD to those based on the new Part 201 standards. The cleanup criteria established pursuant to the Part 201 standards are based on foreseeable uses and exposure

controls. The Part 201 amendments also allow for the use of a mixing zone for calculating the potential impacts of groundwater venting to surface water. If ChemCentral can show that groundwater north of the current collection trench will not exceed the MDEQ groundwater/surface water interface (GSI) values in Cole Drain then the extension may not be necessary.

The 1999 monitoring program has two parts. The Plume Dynamics groundwater monitoring and GSI groundwater monitoring. The objectives of the Plume Dynamics groundwater monitoring program are to monitor groundwater quality within and lateral to the plume, determine if the plume is expanding or contracting and collect additional groundwater data to use in evaluating chemical fate and transport. The objectives of the GSI groundwater monitoring program are to evaluate compliance with Part 201 groundwater cleanup criteria at the groundwater/surface water interface in Cole Drain and to provide a framework to respond to the data collected, including increased or decreased monitoring frequencies, mixing zone determinations and/or implementation of additional response activities. The GSI groundwater monitoring program is designed to detect changes in the chemical concentrations within the groundwater plume south and east of Cole Drain. Attachment 1 depicts the locations of the Site groundwater monitoring wells.

The Plume Dynamics monitoring well network consists of the following wells: 16A, 21A, 23, 24A, 25B, 27B, 29A, S(BR, 32B, 37, 40R, 44, 54A, 54B, 55A, 55B, 56A, 57, 58, 59, 60, 61, PW-1, PW-2, PW-3, PW-4, and SCH-2. Since the last Five-Year Review ChemCentral has installed several additional wells to complete the GSI monitoring network near the North Underdrain: MW-57, MW-58, MW-59, and MW-60. The GSI monitoring network includes a series of sentinel wells, and compliance wells. The current GSI sentinel wells include MW-29A, MW-37, MW-40R, MW-50C, MW-60, and MW-61. PW-4 monitoring data are also evaluated as part of the GSI monitoring program, however PW-4 is part of the remediation system. The GSI compliance wells include MW-26A, MW-54A, MW-54B, MW-55A, MW-55B, MW-57, MW-58, and MW-59.

ChemCentral has completed sixteen rounds of monitoring under the Plume Dynamics and GSI Monitoring Program. As part of that program, the Eighth Monitoring Event (Second Quarter 2002) included additional data evaluations, including an evaluation of trends in concentrations of chemicals in groundwater and a review of flow charts and statistical procedures to determine if they are still appropriate after eight quarters. Results of those sampling events and evaluations are discussed below.

Also as part of the Eighth Monitoring Event (Second Quarter 2002), ChemCentral developed flow charts (see Attachment 2), that will be used to determine what actions will be taken based upon the analyses of the data gathered from the GSI monitoring program.

As discussed above, ChemCentral has been unable to fully implement institutional controls on groundwater use on all of the 9 downgradient properties.

VI. Five-Year Review Process

Administrative Components

The ChemCentral Site Five-Year Review was led by Tim Prendiville of the U.S. EPA, Remedial Project Manager for the Site and Robert Paulson, Community Involvement Coordinator. Cindy Fairbanks of the MDEQ, assisted in the review as the representatives for the support agency.

The review, which began on June 15, 2004, consisted of the following components:

4) Community Involvement;
5) Document Review;
6) Data Review;
7) Site Inspection; and,
8) Five-Year Review Report Development and Review.

Community Involvement

Activities to involve the community in the five-year review were initiated with communication in early 2004 between the RPM and the Community Involvement Coordinator (CIC) for the Site. A notice was sent to *Grand Rapids Press* that a five-year review was to be conducted. The notice was published on September 21, 2004 and invited the public to submit any comments to U.S. EPA. The results of the review and the report were made available at the Wyoming Public Library Superfund Site information repository. No public comments were received during this five-year eview.

Document Review

This five-year review consisted of a review of relevant documents including O&M records and monitoring data (See Attachment 3). Applicable soil and groundwater cleanup standards, as listed in the ROD were also reviewed (See Attachment 4).

Data Review

Both the August 2002, "Plume Dynamics and GSI Monitoring Program, Eighth Monitoring Event, Second Quarter Report (Revised in May 2004)", and the July 2004, "Plume Dynamics and GSI Monitoring Program, Sixteenth Monitoring Event, Second Quarter 2004 Report", provide a comprehensive analysis of the current groundwater contamination at the Site, along with long term trends in contaminant concentrations. The Eighth Monitoring Event Report, includes an evaluation of trends in concentrations of chemicals in groundwater and review of flow charts and statistical procedures to determine if they are still appropriate for use at the site. The trend analyses include a comparison of 2002 data to both data gathered in 1997 and 2000.

Attachment 5 is a table presenting the analytical results from the second quarter of groundwater sampling in 2004. Attachment 6 is a groundwater flow map for the Site. Attachment 7 is a table that summarizes the GSI exceedances in the compliance and sentinel wells and what response actions were taken. Attachment 8 contains figures depicting the plume contours using data from 1997 and 2002. The following are the conclusions reached in the "Eighth Monitoring Event Report" and are further supported by data from the most recent 2004 sampling event.

1) The groundwater continues to flow in a north-northwest direction towards Cole Drain;
2) Fate and transport data from the wells located centrally within the plume indicates a reducing environment whereas wells that are lateral or background to the plume and wells north of 28th Street are within an aerobic environment;
3) The extent of the central plume (defined by the 1.0 parts per billion isoconcentration line) of all chemicals has remained relatively constant throughout the past eight monitoring events;
4) The distribution of PCE and TCE continue to indicate that there is a secondary plume east and possibly south of the ChemCentral source area. The source of the secondary plume is unknown;
5) The concentration of PCE, TCE, and TCA have decreased substantially in the central plume area. Concentrations of degradation products of these chemicals have remained constant or increased;
6) The concentrations of degradation products are further evidence that reductive dechlorination of the upgradient PCE and TCE is occurring;
7) The area of the plume with concentrations of PCE above the GSI criterion decreased substantially between 1997 and 2002. The areas of the plume with TCE concentrations exceeding GSI criterion in 2002 as in 1997 cannot be compared meaningfully due to elevated detection limits. The area of the plume with concentrations of DCE above GSI criterion was approximately the same in 1997 and 2002;
8) The plume has changed little in area, although concentrations overall have decreased. The groundwater collection and treatment system, and biodegradation, appear to be effectively preventing expansion of the plume. The groundwater collection and treatment system has little or no effect on the secondary plume; and,
9) The evaluation of data from 1986 to present indicates that the concentrations of most chemicals have decreased asymptotically in a manner typical of groundwater systems under the influence of active and passive remedial processes;

GSI Monitoring Data

Attachment 2 includes a table listing the wells used to measure compliance with the Michigan Part 201 GSI standards. Attachment 7 is a table that summarizes the GSI exceedances in the compliance and sentinel wells and what response actions were taken. Since 2000 there have been eight instances of GSI exceedances. Several exceedances were determined to be due

to inconsistent operation of the north underdrain when the air stripper was out of service, i.e when the north underdrain was not in operation GSI exceedances occurred. Modifications were made in January 2002 to permit pumping from the north underdrain when the air stripper was out of service. Since then no GSI exceedances have occurred at the affected monitoring locations.

Site Inspection

The inspection at the site was conducted on September 21, 2004. In attendance were Tim Prendiville from U.S. EPA; Cindy Fairbanksfrom MDEQ; Joseph Sheahan from Groundwater Solutions, Inc.; Glenn Hendrix from Earth Tech; and, Shea Muller from Earth Tech. The purpose of the inspection was to assess the protectiveness of the remedy and general conditions of the site treatment systems.

A complete visual inspection of the remedy was conducted by the entire party. The group performed a walk around of the property taking note of the physical condition of the treatment plant, SVE system, air stripper, oil/water separation tank, and other equipment. An inspection was also made of the general condition of all of the monitoring wells and pumping wells that could be located.

In general all of the treatment plant equipment was in good physical condition and operating. The only minor item noted was damaged insulation on the stripper tower. It had been damaged during the most recent tower cleaning and plans have already been made to repair the insulation before cold weather hits.

Except for the instances noted below, the monitoring wells and pumping wells were in good condition. One of the concrete filled guard posts protecting SCH-2 had been damaged and requires replacement or repair. While some wells had permanent placards showing the well numbers, most did not. The riser for MW-52 had apparently been recently run-over by a piece of heavy equipment, requiring repair of the well. Finally, a number of wells could not be located. This was generally due to the accumulation of debris over the areas (the wells are flush mount).

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, applicable or relevant and appropriate requirements (ARARs), risk assumptions, and the results of the site inspection indicates that the on-site equipment is functioning as intended by the ROD. All treatment systems and groundwater monitoring systems should continue operating until cleanup standards are achieved. Operation and maintenance of the SVE system has been effective. The current maintenance procedures, as implemented, will maintain the effectiveness of the response actions.

A review of the ROD and UAO was conducted to determine whether institutional controls are in place and functioning as intended. The ROD required institutional controls, such as deed restrictions, to prohibit the installation of water wells in the site area and any future

development that might disturb contaminated soils. The UAO specified that deed restrictions should be executed and filed to prohibit: 1) use of groundwater underlying the facility; 2) any residential use or any further commercial development of the soil parcel, which would disturb contaminated soils, as defined in Appendix IV of the UAO; 3) any operation at or use of the ChemCentral property that will interfere with the work required by the UAO; and 4) any residential or commercial use of the ChemCentral property or any other activity that would interfere or disturb any remedial action component required by the UAO. The UAO required ChemCentral to submit deed restrictions for U.S. EPA approval, and execute and file the approved deed restrictions. The UAO required ChemCentral to place the deed restrictions on its own property, and to use best efforts, including payment of reasonable sums of money, to obtain agreements with the owners of the downgradient properties to place restrictions on those properties.

A copy of the deed restrictions are found at Attachment 10, and prohibit specific uses on the "Groundwater Pacel", the "Soil Parcel", and "Both Pacels". In addition to prohibiting groundwater use, and residential or further commercial development, the deed restrictions prohibit activities that would interfere with, damage, or otherwise impair the effectiveness of any response action, and requires the owners to install permanent markers on each side of the property that describe the restricted area and the nature of the prohibitions. Further, the deed restrictions state that the restrictions run with the land and shall be binding upon the owner and their respective successors, assigns and transferees, and the restrictions "As to Both Parcels" shall continue in perpetuity, or for the other parcels, remain until U.S. EPA issues a determination or a court of competent jurisdiction rules to either modify or terminate the restrictions.

The deed restrictions have been executed and recorded in the chain of title of the ChemCentral property, and three of nine downgradient properties. A full review of the deed restrictions will be conducted to determine whether the restrictions are sufficient. Full implementation of the required institutional controls on the downgradient properties to prevent exposure to contaminated groundwater has been identified as an issue. While no one is currently using the groundwater in the area, full implementation of the controls is necessary to ensure future landowners do not install groundwater wells. While all of the downgradient properties have had deed notices of restricted groundwater use placed on them, only the owners of three of the nine affected parcels have acknowledged the notices. Within 12 months the deed restrictions will be evaluated to determine if they "run with the land", have been executed correctly, may be negatively impacted by prior in time encumbrances, provide adequate notice to future owners and will be monitored to ensure its continued existence. If necessary an institutional control monitoring plan will be developed to address any additional steps needed for long term protectiveness.

The MDEQ has noted that the institutional controls should include restrictions on construction in the vicinity of the extraction wells to avoid damage to the extraction wells and conveyance pipes. The MDEQ has also requested that there be an evaluation of the need for rehabilitation/redevelopment of the site monitoring wells. They have cited concerns about the productivity and age of the some of the wells as reasons for the need to rehabilitate some of the

wells. U.S. EPA is currently working with Chemcentral and MDEQ in compiling the information needed to assess the need for rehabilitation/redevelopment of the wells. The parties will also work to establish a well rehabilitation/redevelopment plan to be incorporated into the regular operation and maintenance plan for the Site.

The ROD required the installation and operation of an expansion of the current off-property groundwater collection system, by either extending the interceptor trench or installing additional purge wells. Based on the results of the current groundwater monitoring program it appears that an expansion of the collection system is not necessary to ensure complete capture of the plume. Wells to the north west of the collection trench have shown no bypass of the system. As a result the Agency should consider amending the ROD to remove the requirement for the extension.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Land use remains consistent with that at the time of the original ROD. A comparison of the soil cleanup standards to the current Michigan Part 201 standards in Attachment 4 shows that the ROD standards remain protective. Attachment 4 also compares the groundwater cleanup standards established in the ROD to current Michigan Part 201 standards, maximum contaminant levels (MCLs). For all of the contaminants the cleanup standards have either remained the same, or have increased. Therefore the standards for this site are considered protective and significant progress has been made toward reaching the remedial action objectives for the site.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No weather-related events have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

There have been no changes in the physical conditions of the site that would effect the protectiveness of the remedy. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

VIII. Issues

Table 3: Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Deed restrictions	N	Y
Insulation on air stripper tower needs repair	N	N
The location and condition of all wells not found during the inspection need to be verified	N	N
All wells should be marked with a permanent identification plates.	N	N
Well guard at SCH-2 requires repair	N	N
MW-52 riser needs repair	N	N
Consider Amending ROD to eliminate requirement for collection trench extension	N	N
Need to rehabilitate/redevelop the monitoring wells	N	Y
Identify and properly abandon any wells no longer in use	N	N

IX. Recommendations and Follow-up Actions

Table 4: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Deed Restrictions	Place deed restriction on section of property where residential standards are exceeded; ensure they prohibit construction near extraction system	PRP	U.S. EPA	11/16/05	N	Y
Insulation on air stripper tower needs repair	ChemCentral will repair	ChemCentral	U.S. EPA	11/16/2005	N	N
The location and condition of all wells not found during the inspection need to be verified	ChemCentral will verify location of wells during next round of sampling	ChemCentral	U.S. EPA	11/16/2005	N	N
All wells should be marked with a permanent identification plates.	ChemCentral will place permanent markers on all wells	ChemCentral	U.S. EPA	11/16/2005	N	N
Well guard at SCH-2 requires repair	ChemCentral will repair well guard	ChemCentral	U.S. EPA	11/16/2005	N	N
MW-52 riser needs repair	ChemCentral will repair	ChemCentral	U.S. EPA	11/16/2005	N	N
Consider Amending ROD to eliminate requirement for collection trench extension	EPA, in consultation with MDEQ will consider whether a proposal to amend the ROD is appropriate	U.S. EPA	U.S. EPA	11/16/2005	N	N

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Need to rehabilitate/re-develop the monitoring wells	EPA will work with ChemCentral and MDEQ to evaluate the need to rehabilitate/redevelop the monitoring wells.	ChemCentral	U.S. EPA	11/16/2005	N	Y
Identify and properly abandon any wells no longer in use	Identify any wells no longer in use or necessary for the remedy. ChemCentral will properly abandon such wells	ChemCentral	U.S. EPA	11/16/2005	N	N

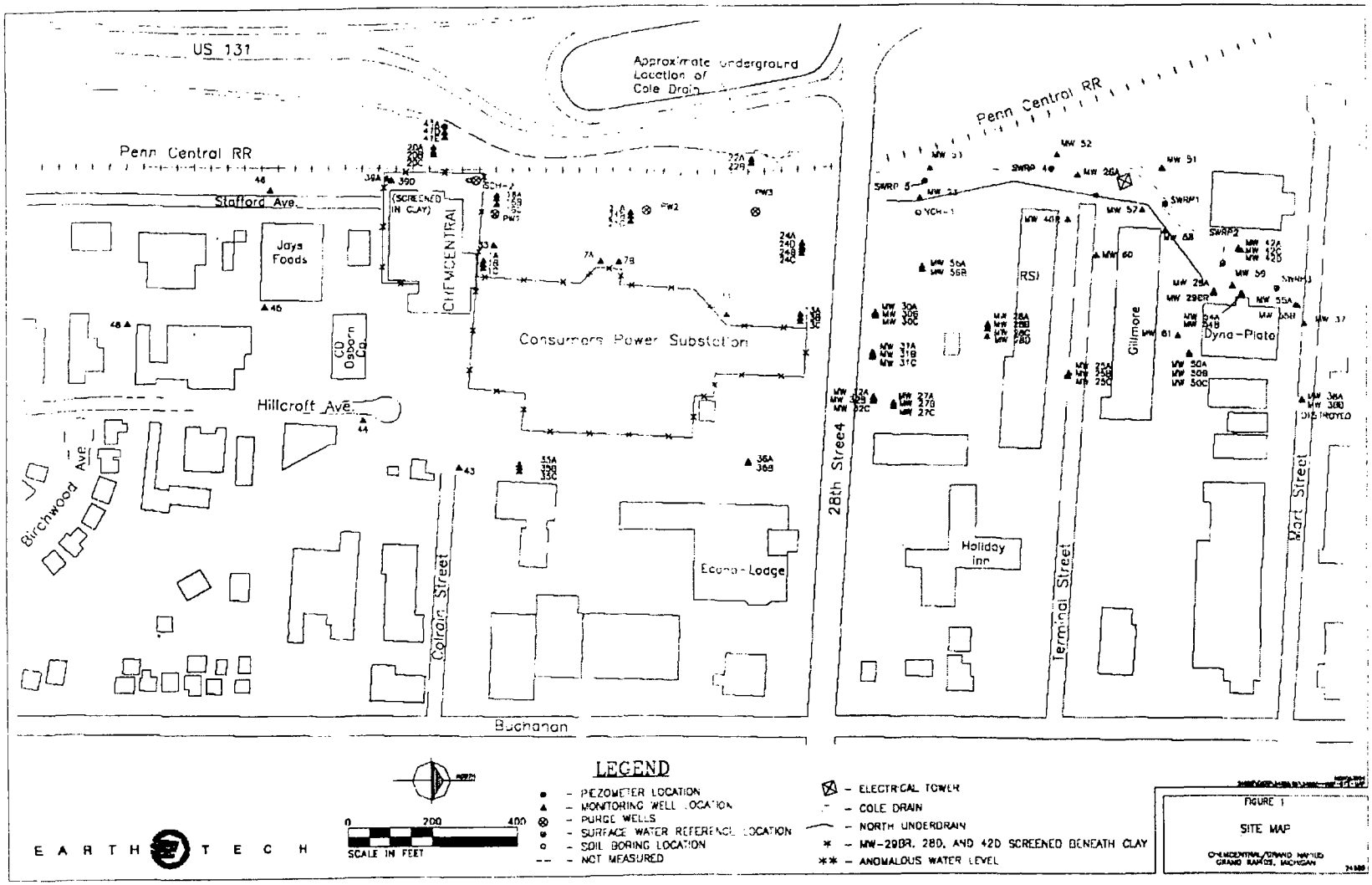
X. Protectiveness Statement

The remedy at the ChemCentral Site currently protects human health and the environment because the groundwater collection and treatment system, the soil vapor extraction system, and groundwater monitoring program protect human health and the environment in the short term. However, in order for the remedy to be protective in the long-term, institutional controls need to be put in place to prevent exposure to contaminated groundwater and soils

XI. Next Review

The next five-year review for the ChemCentral Site is required by November 16, 2009, five years from the date of this review.

Attachment 1 **Site Map**


US 131
Approximate underground Location of Cole Drain
Penn Central RR
Stafford Ave.
(SCREENED IN CLAY)
CHEMICENTRAL
Jays Foods
CD Osborn Co.
Consumers Power Substation
Hillcroft Ave.
Birchwood Ave.
Colvin Street
Econo-Lodge
Buchanan
28th Street
Penn Central RR
RSI
Gillmore
Dyna-Plate
Holiday Inn
Terminal Street
Dart Street
LEGEND
- PIEZOMETER LOCATION
- MONITORING WELL LOCATION
- PURGE WELLS
- SURFACE WATER REFERENCE LOCATION
- SOIL BORING LOCATION
- NOT MEASURED
- ELECTRICAL TOWER
- COLE DRAIN
- NORTH UNDERDRAIN
* - MW-29BR, 28D, AND 42D SCREENED BENEATH CLAY
** - ANOMALOUS WATER LEVEL
0 200 400
SCALE IN FEET
EARTH TECH
FIGURE 1
SITE MAP
CHEMICENTRAL/GRAND HAVEN
GRAND RAPIDS, MICHIGAN

Attachment 2 Flow Charts

APPENDIX B

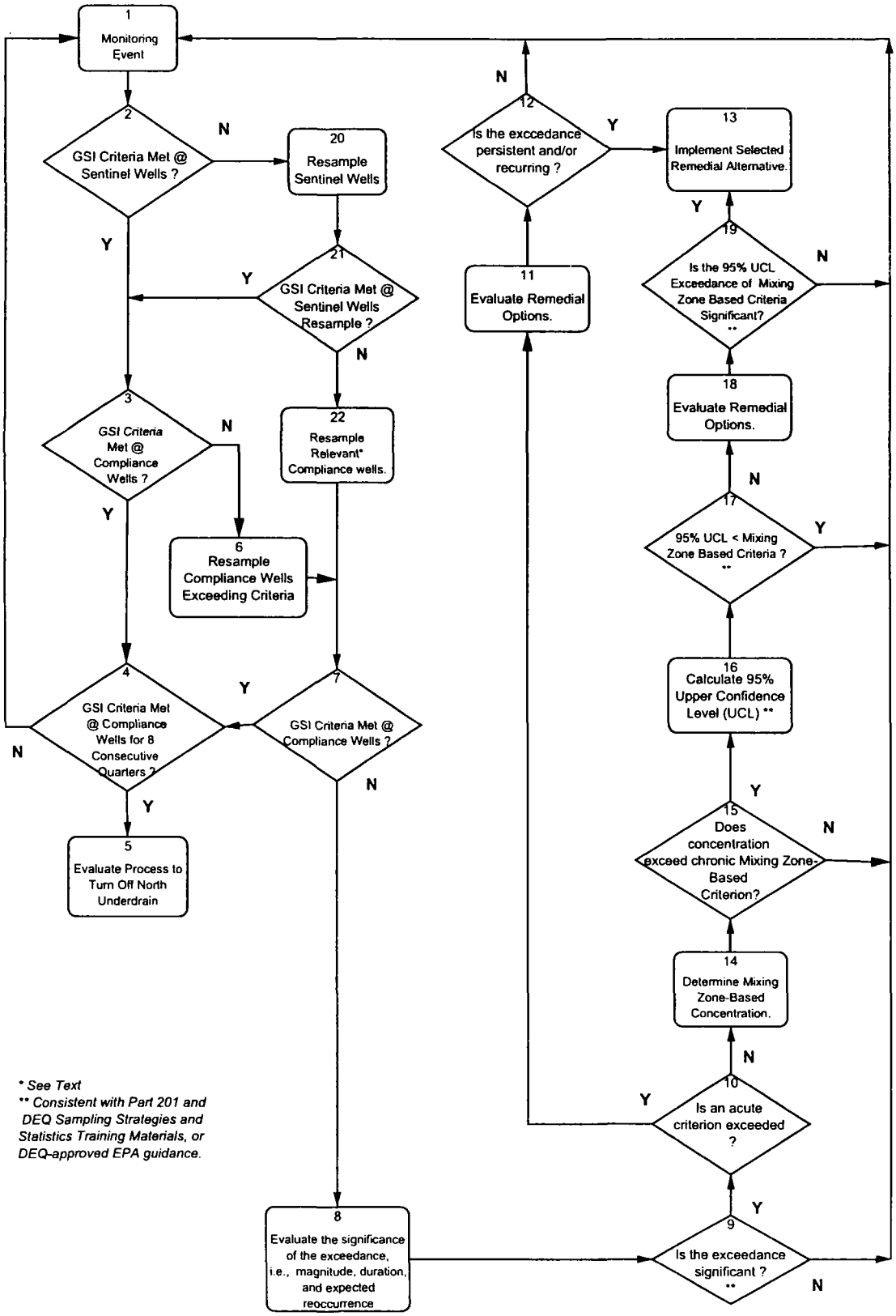
REVISED MONITORING PROGRAM AND FLOW CHARTS

Chemcentral provided draft revised flow charts for the monitoring programs to the MDEQ and USEPA. Chemcentral modified these charts in response to comment from these agencies. These modifications included specifying quarterly monitoring of GSI compliance and sentinel wells in the Long Term monitoring program, providing a separate response to exceedances of final acute values, minor clarifications to the wording regarding acute and chronic criteria, providing explanatory text for the flow charts, and defining "relevant" compliance wells in the flow charts.

The modified flow charts are attached. The "relevant" compliance wells are the compliance wells generally downgradient of specific sentinel wells as listed below:

Sentinel Well	Relevant Compliance Wells
MW-40R	MW-26A, MW-57, MW-58
MW-60	MW-57, MW-58, MW-59
MW-29A	MW-58, MW-59, MW-54A, MW-54B
MW-61	MW-59, MW-54A, MW-54B, MW-55A, MW-55B
MW-37	MW-55A, MW-55B
PW-4	MW-59, MW-54A, MW-54B, MW-55A, MW-55B

Each sentinel well has multiple relevant compliance wells associated with it. The relevant compliance wells are the compliance wells that are potentially downgradient from the sentinel wells. This approach recognizes any single compliance well may not be directly downgradient from a sentinel well. This approach provides for several compliance wells to be sampled for each sentinel well and offers a lateral spread that covers more area down gradient of each sentinel well, significantly increasing the effectiveness of the specified resampling.



* *See Text*

** *Consistent with Part 201 and DEQ Sampling Strategies and Statistics Training Materials, or DEQ-approved EPA guidance.*

Figure B-1
GSI MONITORING PROGRAM
CHEMCENTRAL Grand Rapids Site
Grand Rapids, Michigan
November 10, 2004

Attachment 3

Documents Reviewed

Plume Dynamics and GSI Groundwater Monitoring Program, Sixteenth Monitoring Report, Second Quarter 2004, Earth Tech, July 2004.

*Plume Dynamics and GSI Groundwater Monitoring Program, Eighth Monitoring Event, Second Quarter 2002, **Revised***, Earth Tech, May 2004.

ChemCentral Superfund Site, Wyoming, Michigan, Five-Year Review (Type 1A), November 16, 1999.

Plume Dynamics and GSI Groundwater Monitoring Program, Earth Tech, June 1, 1999.

Operations and Maintenance Plan for the Remedial Action Systems at the ChemCentral Corporation, Wyoming, Michigan Site, Earth Tech, April 1995.

Unilateral Administrative Order, March 31, 1992

Record of Decision, EPA, September 30, 1991

Five-Year Review, Type 1A, EPA, November 16, 1999

Attachment 4

Comparison of Site's Groundwater Target Concentration Limits (TCLs) to Current Michigan Part 201 Residential Drinking Water Criteria					
Chemical	ROD TCLs (ppb)	2004 MI Part 201 Residential Drinking Water Criteria (ppb)	2004 Federal MCL (ppb)	2004 MI Part 201 GSI Criteria (ppb)	Max Concentration Detected in 2004 (ppb)
Benzene	1	5.0	5.0	200	ND
Bis(2-ethylhexyl)phthalate	2	6.0	-	32	ND
Chloroethane	9	430	-	-	8800
1,1-Dichloroethane	700	880	-	740	2800
1,2-Dichloroethane	0.4	5.0	5.0	360	ND
1,2-Dichloroethene	70	70	70	620	10000
1,1-Dichloroethylene	7	7.0	7	65	ND
Trans-1,2-Dichloroethylene	100	100	100	1500	26000
Ethylbenzene	30	74	70	18	4900
Methylene Chloride	5	5.0	-	940	ND
2-Methylnaphthalene	10	260	-	-	-
2-Methylphenol	40	370	-	71	43
Naphthalene	29	520	-	13	180
Pentachlorophenol	0.3	1.0	1.0	-	2.6
Tetrachloroethylene	0.7	5.0	-	45	420
Toluene	100	790	1000	140	48000
1,1,1-Trichloroethane	117	200	200	200	8600
1,1,2,2-Tetrachloroethane	0.2	8.5	5.0	-	ND
Trichloroethylene	3	5.0	5.0	330	650
Vinyl Chloride	0.02	2.0	2.0	15	330
Xylene	59	280	10000	35	16000

Comparison of Site Soil Cleanup Standards to 2004 Michigan Part 201 Standards					
	ROD Soil Cleanup Standards (µg/kg)		2004 MI Part 201 Soil Standards (µg/kg)		
Chemical	20 x Groundwater	Direct Contact	Residential; Drinking Water Protection	Industrial and Commercial Direct Contact	GSI
Bis(2-ethylhexyl)phthalate	40	90000	-	10000000	-
Butylbenzylphthalate	20000	50000000	310000	310000	26000
Chlordane	0.01	1000	-	150000	-
Chrysene	100	100	-	8000000	-
Di-n-octylphalate	2000	5000000	100000000	20000000	-
1,2-Dichloroethene	1000	800000	1400	640000	12000
Ethylbenzene	600	8000000	1500	140000	360
Isophorone	200	90000	15000	2400000	11000
2-Methylnaphthalene	200	400000	57000	26000000	-
Naphthalene	600	1000000	35000	52000000	870
Tetrachloroethylene	10	8000	100	88000	900
Toluene	2000	16000000	16000	250000	2800
1,1,1-Trichloroethane	2000	400000	4000	460000	4000
Trichloroethylene	60	40000	100	500000	4000
Xylene	1200	160000000	5600	150000	700

Attachment 5 — 2nd Quarter 2004Groundwater Analytical Results

Microsoft Excel
Worksheet

Table 2
Summary of Groundwater Analytical Results
ChemCentral
Grand Rapids, Michigan
(Units as Given)

Site Identification:		Part 201	MW-16A	MW-16A	MW-16A	MW-16ABC	MW-21A	MW-21A	MW-21A	MW-21ABC	MW-23	MW-24A	MW-24A	MW-24A	MW-24ABC	MW-25B	MW-27B	MW-27B	MW-28B	MW-29A	MW-29BR	MW-32B	MW-37
Sample Identification:		Groundwater	E358755	E358731	E358716	E358717	E358756	E358732	E358718	E358719	E358722	E358757	E358733	E58720	E58721	E358743	E358739	E358740	E358741	E358745	E385746	E358735	E358754
Date Sampled:		Surface	4/14/04	4/14/04	4/14/04	4/14/04	4/14/04	4/14/04	4/14/04	4/15/04	4/13/04	4/15/04	4/15/04	4/15/04	4/15/04	4/14/04	4/13/04	4/13/04	4/13/04	4/14/04	4/14/04	4/13/04	4/14/04
Sampled By:		Water	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO
Analyzed By:		Interface	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix
Sampling Frequency:		Criteria	Central Plume	Central Plume	Central Plume Court Ordered	Central Plume Composite	Central Plume	Central Plume	Central Plume Court Ordered	Central Plume Composite	W Lateral	Central Plume	Central Plume	Central Plume Court Ordered	Central Plume Composite	Central Plume	E Lateral	E Lateral Duplicate	Central Plume	Sentinel to MW-59		E Lateral	Sentinel to MW-55A/55B
Comments:			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatiles	***Units***																						
1,2-Dichloroethylene, total	ug/L	NA	-	-	10000	20	-	-	26000	54	<2	-	-	<2	<2	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	ug/L	65 (X)	<250	-	<250	<1	<500	-	<500	<2	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	ug/L	740	790	-	790	8.5	2800	-	2800	<2	<1	3.2	-	3.2	<1	<1	<1	<1	<1	1.6	<1	<1	<1
1,1,1-Trichloroethane	ug/L	200	8600	-	8600	23	<500	-	<500	3.6	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	360 (X)	<250	-	<250	<1	<500	-	<500	<2	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/L	290 (X)	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	ug/L	78 (X)	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	ug/L	330 (X)	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
2-Chloroethyl vinyl ether	ug/L	NA	-	-	<2500	<10	-	-	<5000	<20	<10	-	-	<10	<10	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	ug/L	620	10000	-	-	-	26000	-	-	-	-	<1	-	-	-	<1	<1	<1	<1	2	2.4	<1	<1
4-Methyl-2-pentanone	ug/L	ID	<1300	<250	<1300	<5	<2500	<250	<2500	<10	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Acetone	ug/L	1,700	-	-	<13000	<50	-	-	<25000	<100	<50	-	-	<50	<50	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	ug/L	1,500	<250	-	-	-	<500	-	-	-	-	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1
Benzene	ug/L	200 (X)	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
Bromomethane	ug/L	35	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
Ethane	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	ug/L	ID	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
Carbon tetrachloride	ug/L	45 (X)	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
Ethylene	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	ug/L	47	<250	-	<250	<1	<500	-	<500	<2	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/L	ID	<250	-	<250	5.5	8800	-	8800	<2	<1	32	-	32	3.9	<1	<1	<1	<1	<1	<1	<1	<1
Methane	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	ug/L	170 (X)	<250	-	<250	<1	<500	-	<500	<2	<1	<1	-	<1	<1	1.6	<1	<1	<1	<1	<1	<1	<1
Chloromethane	ug/L	ID	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	ug/L	NA	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
Chlorodibromomethane	ug/L	ID	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	ug/L	16	<250	-	<250	<1	<500	-	<500	<2	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	ug/L	38	<250	-	<250	<1	<500	-	<500	<2	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/L	13	<250	-	<250	<1	<500	-	<500	<2	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	ug/L	18	3700	-	3700	1.3	4900	-	4900	<2	<1	9.2	-	9.2	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone	ug/L	2,200	-	-	<1300	<5	-	-	<2500	<10	<5	-	-	<5	<5	-	-	-	-	-	-	-	-
Methylene chloride	ug/L	940 (X)	<250	-	<250	<1	<500	-	<500	<2	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	ug/L	140	24000	-	24000	9.2	49000	-	49000	<2	<1	1.1	-	1.1	14	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	NA	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
Trichloroethene	ug/L	200 (X)	650	-	650	2.9	<500	-	<500	54	<1	<1	-	<1	<1	<1	<1	<1	1.5	<1	<1	<1	<1
Vinyl chloride	ug/L	15	<250	-	<250	9	<500	-	<500	34	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene	ug/L	35	16000	-	16000	8.9	19000	-	19000	<6	<3	36	-	36	4	<3	<3	<3	<3	<3	<3	<3	<3
Dichlorobromomethane	ug/L	ID	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
Naphthalene	ug/L	13	<1300	-	-	-	<2500	-	-	-	-	14	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethene	ug/L	45 (X)	290	-	290	1.5	<500	-	<500	2	<1	<1	-	<1	<1	9.8	14	16	6.2	<1	<1	25	<1
Trichlorofluoromethane	ug/L	NA	-	-	<250	<1	-	-	<500	<2	<1	-	-	<1	<1	-	-	-	-	-	-	-	-
Semi-Volatiles	***Units***																						
Bis(2-ethylhexyl)-phthalate	ug/L	32	<5	-	-	-	<5	-	-	-	-	<5	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	ug/L	380	<5	-	-	-	37	-	-	-	-	<5	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	ug/L	71	16	-	-	-	43	-	-	-	-	<5	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	ug/L	(G,X)	MS 2.1	-	-	-	2.6	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
Field Measurements	***Units***																						
pH, field	S.U.	NA	7.11	-	-	-	6.77	-	-	-	7.42	6.34	-	-	-	7.61	6.30	-	6.31	7.75	7.12	7.75	7.28
Turbidity	NTU	NA	2	-	-	-	0	-	-	-	0	0	-	-	-	0	0	-	0	106	0	0	0
Specific Conductivity	mmhos	NA	1.820	-	-	-	1.170	-	-	-	2.860	1.210	-	-	-	0.910	1.300	-	1.910	3.840	2.690	1.150	1.390
Oxygen, dissolved	mg/L	(EE)	1.01	-	-	-	0.52	-	-	-	0.35	1.17	-	-	-	4.96	5.91	-	1.24	3.14	0.58	8.00	2.49
Temperature, field	Deg. C.	NA	13.2	-	-	-	12.3	-	-	-	11.7	10.6	-	-	-	9.1	11.1	-	9.4	11.2	12.2	12.1	13.0
Iron, ferrous	mg/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redox	mV	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

** MW-57 ran dry while purging. Field measurements were

Table 2
Summary of Groundwater Analytical Results
ChemCentral
Grand Rapids, Michigan
(Units as Given)

Site Identification:		Part 201	MW-40R	MW-40R	MW-44	MW-54A	MW-54A	MW-54B	MW-55A	MW-55B	MW-56A	MW-57	MW-58	MW-59	MW-60	MW-61	PW-1	PW-1	PW-1	PW-2	PW-2	PW-2	PW-2	PW-3
Sample Identification:		Groundwater	E358752	E358753	E358758	E358760	E358761	E358763	E358766	E358765	E358738	E358742	E358764	E358744	E358767	E358762	E358749	E358725	E358730	E358748	E358724	E358729	E358747
Date Sampled:		Surface	4/14/04	4/14/04	4/15/04	4/16/04	4/16/04	4/16/04	4/16/04	4/16/04	4/13/04	4/13/04	4/16/04	4/14/04	4/16/04	4/16/04	4/14/04	4/14/04	4/14/04	4/14/04	4/14/04	4/14/04	4/14/04	4/14/04
Sampled By:		Water	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO
Analyzed By:		Interface	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix
Sampling Frequency:		Criteria	Sentinel to MW-57	Sentinel to MW-57	-	GSI Compliance	GSI Compliance	GSI Compliance	GSI Compliance	GSI Compliance	Central Plume	GSI Compliance	GSI Compliance	GSI Compliance	Sentinel to MW-58	Sentinel to MW-54A/B	Central Plume	Central Plume	Central Plume	Central Plume	Central Plume	Central Plume	Central Plume	Central Plume
Comments:			-	Duplicate	-	-	Duplicate	-	-	-	-	-	-	-	-	-	-	Court Ordered	-	-	Court Ordered	-	-	-
Volatiles	***Units***																							
1,2-Dichloroethylene, total	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2800**	-	-	**3800**	-	-	-
1,1-Dichloroethylene	ug/L	65 (X)	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<100	<100	-	<50	<50	-	<25
1,1-Dichloroethane	ug/L	740	**1.4**	**1.6**	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	**3.6**	<1	**290**	**290**	-	**890**	**890**	-	**310**
1,1,1-Trichloroethane	ug/L	200	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	**3100**	**3100**	-	**500**	**500**	-	**150**
1,2-Dichloroethane	ug/L	360 (X)	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<100	<100	-	<50	<50	-	<25
1,2-Dichloropropane	ug/L	290 (X)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
1,1,2,2-Tetrachloroethane	ug/L	78 (X)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
1,1,2-Trichloroethane	ug/L	330 (X)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
2-Chloroethyl vinyl ether	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1000	-	-	<500	-	-
cis-1,2-Dichloroethene	ug/L	620	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	**2800**	-	-	**3800**	-	-	**2600**
4-Methyl-2-pentanone	ug/L	ID	<5	<5	<5	<5	<5	<5	<5	<5	<50	<5	<5	<5	<5	<5	<500	<500	**100**	<250	<250	<25	<130
Acetone	ug/L	1,700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5000	-	-	<2500	-	-
trans-1,2-Dichloroethene	ug/L	1,500	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<100	-	-	<50	-	-	<25
Benzene	ug/L	200 (X)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
Bromomethane	ug/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
Ethane	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	ug/L	ID	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
Carbon tetrachloride	ug/L	45 (X)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
Ethylene	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	ug/L	47	<1	<1	<1	<1	<1	<1	<1	<1	**29**	<1	<1	<1	<1	<1	<100	<100	-	<50	<50	-	<25
Chloroethane	ug/L	ID	<1	<1	<1	<1	<1	<1	<1	<1	**1600**	<1	<1	<1	**62**	<1	<100	<100	-	**1600**	**1600**	-	**1600**
Methane	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	ug/L	170 (X)	<1	<1	<1	<1	<1	**1.2**	<1	<1	<10	<1	<1	<1	<1	**2**	<100	<100	-	<50	<50	-	<25
Chloromethane	ug/L	ID	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
cis-1,3-Dichloropropene	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
Chlorodibromomethane	ug/L	ID	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
1,2-Dichlorobenzene	ug/L	16	<1	<1	<1	<1	<1	<1	<1	<1	**12**	<1	<1	<1	**1.2**	<1	<100	<100	-	<50	<50	-	<25
1,3-Dichlorobenzene	ug/L	38	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<100	<100	-	<50	<50	-	<25
1,4-Dichlorobenzene	ug/L	13	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<100	<100	-	<50	<50	-	<25
Ethylbenzene	ug/L	18	<1	<1	<1	<1	<1	<1	<1	<1	**24**	<1	<1	<1	<1	<1	**1200**	**1200**	-	**530**	**530**	-	**750**
2-Butanone	ug/L	2,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<500	-	-	<250	-	-
Methylene chloride	ug/L	940 (X)	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<100	<100	-	<50	<50	-	<25
Toluene	ug/L	140	**2.6**	**1.2**	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	**11000**	**11000**	-	**5600**	**5600**	-	**3800**
trans-1,3-Dichloropropene	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
Trichloroethene	ug/L	200 (X)	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	**270**	**270**	-	<50	<50	-	<25
Vinyl chloride	ug/L	15	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	**140**	**140**	-	**130**	**130**	-	**330**
Xylene	ug/L	35	<3	<3	<3	<3	<3	<3	<3	<3	**[redacted]**	<3	<3	<3	<3	<3	**5200**	**5200**	-	**1900**	**1900**	-	**2600**
Dichlorobromomethane	ug/L	ID	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
Naphthalene	ug/L	13	<5	<5	<5	<5	<5	<5	<5	<5	**[redacted]**	<5	<5	<5	<5	<5	<500	-	-	<250	-	-	<130
Tetrachloroethene	ug/L	45 (X)	<1	<1	**[redacted]**	**5.6**	**5.7**	**5.3**	<1	<1	<10	<1	<1	<1	<1	**13**	**420**	**420**	-	<50	<50	-	<25
Trichlorofluoromethane	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	<50	-	-
Semi-Volatiles	***Units***																							
Bis(2-ethylhexyl)-phthalate	ug/L	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	ug/L	380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	ug/L	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	ug/L	(G,X)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Measurements	***Units***																							
pH, field	S.U.	NA	**7.32**	-	**6.95**	**6.21**	-	**6.58**	**6.95**	**6.96**	**7.49**	**7.42**	**7.41**	**8.84**	**7.47**	**7.27**	-	-	-	-	-	-	-	-
Turbidity	NTU	NA	**0**	-	**0**	**0**	-	**0**	**0**	**0**	**0**	**17**	**0**	**61**	**4**	**0**	-	-	-	-	-	-	-	-
Specific Conductivity	mmhos	NA	**2.310**	-	**1.280**	**1.330**	-	**1.730**	**1.300**	**1.460**	**0.963**	**2.620**	**2.690**	**1.570**	**2.050**	**1.210**	-	-	-	-	-	-	-	-
Oxygen, dissolved	mg/L	(EE)	**0.61**	-	**6.16**	**2.79**	-	**2.57**	**4.40**	**3.70**	**0.40**	**1.53**	**0.44**	**0.62**	**1.08**	**4.90**	-	-	-	-	-	-	-	-
Temperature, field	Deg. C.	NA	**9.1**	-	**13.8**	**12.3**	-	**11.5**	**14.5**	**14.4**	**8.8**	**10.3**	**12.3**	**11.0**	**11.1**	**11.7**	-	-	-	-	-	-	-	-
Iron, ferrous	mg/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redox	mV	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

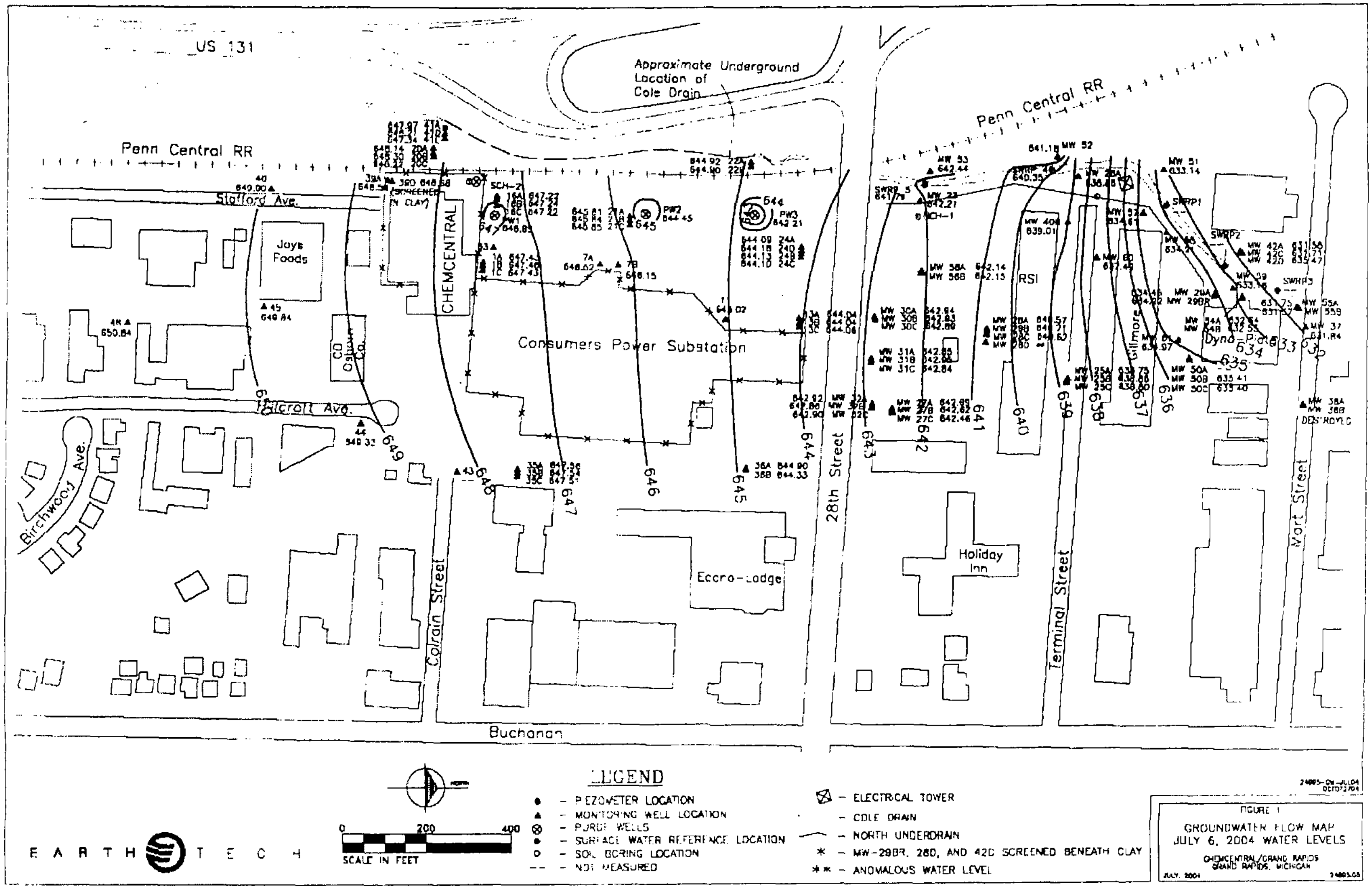
** MW-57 ran dry while purging. Field measurements were

Table 2
Summary of Groundwater Analytical Results
ChemCentral
Grand Rapids, Michigan
(Units as Given)

Site Identification:		Part 201	PW-3	PW-3	PW-4	PW-4	PW-4	PW-4	SCH-2	SCH-2	SCH-2	Equip Blank	Equip Blank	Equip Blank	Trip Blank
Sample Identification:		Groundwater	E358723	E358728	E358750	E361364	E358726	E361365	E358768	E358727	E358734	E358751	E358737	E358759	E358736
Date Sampled:		Surface	4/14/04	4/14/04	4/14/04	5/18/04	4/14/04	5/18/04	4/16/04	4/16/04	4/16/04	4/14/04	4/13/04	4/16/04	4/7/04
Sampled By:		Water	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO	ETCO
Analyzed By:		Interface	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix	TriMatrix
Sampling Frequency:		Criteria	Central Plume	Central Plume	In north underdrain	In north underdrain	In north underdrain	In north underdrain	-	-	-	-	-	-	-
Comments:			Court Ordered	-	-	Resample	Court Ordered	CO Resample	-	Court Ordered	-	@MW-40R	@MW-56A	@MW-61	
Volatiles	***Units***														
1,2-Dichloroethylene, total	ug/L	NA	**2600**	-	-	-	**100**	**4**	-	**1200**	-	-	-	-	-
1,1-Dichloroethylene	ug/L	65 (X)	<25	-	<2	<1	<2	<1	**54**	**54**	-	<1	<1	<1	<1
1,1-Dichloroethane	ug/L	740	**310**	-	**9.9**	**1.8**	**9.9**	**1.8**	<10	<10	-	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/L	200	**150**	-	**100**	**4**	**100**	**4**	<10	<10	-	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	360 (X)	<25	-	<2	<1	<2	<1	<10	<10	-	<1	<1	<1	<1
1,2-Dichloropropane	ug/L	290 (X)	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
1,1,2,2-Tetrachloroethane	ug/L	78 (X)	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
1,1,2-Trichloroethane	ug/L	330 (X)	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
2-Chloroethyl vinyl ether	ug/L	NA	<250	-	-	-	<20	<10	-	<100	-	-	-	-	-
cis-1,2-Dichloroethene	ug/L	620	-	-	**100**	**4**	-	-	**1200**	-	-	<1	<1	<1	<1
4-Methyl-2-pentanone	ug/L	ID	<130	<5	<10	<5	<10	<5	<50	<50	<5	<5	<5	<5	<5
Acetone	ug/L	1,700	<1300	-	-	-	<100	<50	-	<500	-	-	-	-	-
trans-1,2-Dichloroethene	ug/L	1,500	-	-	<2	<1	-	-	<10	-	-	<1	<1	<1	<1
Benzene	ug/L	200 (X)	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
Bromomethane	ug/L	35	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
Ethane	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	ug/L	ID	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
Carbon tetrachloride	ug/L	45 (X)	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
Ethylene	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	ug/L	47	<25	-	<2	<1	<2	<1	<10	<10	-	<1	<1	<1	<1
Chloroethane	ug/L	ID	**1600**	-	**43**	**11**	**43**	**11**	<10	<10	-	<1	<1	<1	<1
Methane	ug/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	ug/L	170 (X)	<25	-	<2	<1	<2	<1	<10	<10	-	<1	<1	<1	<1
Chloromethane	ug/L	ID	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
cis-1,3-Dichloropropene	ug/L	NA	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
Chlorodibromomethane	ug/L	ID	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
1,2-Dichlorobenzene	ug/L	16	<25	-	<2	<1	<2	<1	<10	<10	-	<1	<1	<1	<1
1,3-Dichlorobenzene	ug/L	38	<25	-	<2	<1	<2	<1	<10	<10	-	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/L	13	<25	-	<2	<1	<2	<1	<10	<10	-	<1	<1	<1	<1
Ethylbenzene	ug/L	18	**750**	-	**19**	<1	**19**	<1	<10	<10	-	<1	<1	<1	<1
2-Butanone	ug/L	2,200	<130	-	-	-	<10	-	-	<50	-	-	-	-	-
Methylene chloride	ug/L	940 (X)	<25	-	<2	<1	<2	<1	<10	<10	-	<1	<1	<1	<1
Toluene	ug/L	140	**3000**	-	**270**	**1.1**	**270**	**1.1**	**13**	**13**	-	<1	<1	<1	<1
trans-1,3-Dichloropropene	ug/L	NA	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
Trichloroethene	ug/L	200 (X)	<25	-	**5.6**	<1	**5.6**	<1	<10	<10	-	<1	<1	<1	<1
Vinyl chloride	ug/L	15	**320**	-	<2	<1	<2	<1	**240**	**240**	-	<1	<1	<1	<1
Xylene	ug/L	35	**2600**	-	**110**	<3	**110**	<3	<30	<30	-	<3	<3	<3	<3
Dichlorobromomethane	ug/L	ID	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
Naphthalene	ug/L	13	-	-	<10	<5	-	-	<50	-	-	<5	<5	<5	<5
Tetrachloroethene	ug/L	45 (X)	<25	-	**5**	<1	**5**	<1	<10	<10	-	<1	<1	<1	<1
Trichlorofluoromethane	ug/L	NA	<25	-	-	-	<2	<1	-	<10	-	-	-	-	-
Semi-Volatiles	***Units***														
Bis(2-ethylhexyl)-phthalate	ug/L	32	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	ug/L	380	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	ug/L	71	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	ug/L	(G,X)	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Measurements	***Units***														
pH, field	S.U.	NA	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	NA	-	-	-	-	-	-	-	-	-	-	-	-	-
Specific Conductivity	mmhos	NA	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxygen, dissolved	mg/L	(EE)	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature, field	Deg. C.	NA	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, ferrous	mg/L	NA	-	-	-	-	-	-	-	-	-	-	-	-	-
Redox	mV	NA	-	-	-	-	-	-	-	-	-	-	-	-	-

** MW-57 ran dry while purging. Field measurements were

Attachment 6 **Groundwater Flow Map**


US 131
Approximate Underground Location of Cole Drain
Penn Central RR
Penn Central RR
Stafford Ave.
Joys Foods
CHEMCENTRAL
Consumers Power Substation
Hillcroft Ave.
Birchwood Ave.
Colrain Street
28th Street
Terminal Street
Mart Street
Gillmore
Dyno-Pac
RSI
Holiday Inn
Econo-Lodge
Buchanan
LEGEND
– PIEZOMETER LOCATION
– MONITORING WELL LOCATION
– PURGE WELLS
– SURFACE WATER REFERENCE LOCATION
– SOIL BORING LOCATION
– NOT MEASURED
– ELECTRICAL TOWER
– COLE DRAIN
– NORTH UNDERDRAIN
– MW-29BR, 28D, AND 42C SCREENED BENEATH CLAY
– ANOMALOUS WATER LEVEL
SCALE IN FEET
0 200 400
EARTH TECH
FIGURE 1
GROUNDWATER FLOW MAP
JULY 6, 2004 WATER LEVELS
CHEMCENTRAL/GRAND RAPIDS
GRAND RAPIDS, MICHIGAN
JULY, 2004

Attachment 7 **GSI Exceedances**

TABLE 4
SUMMARY OF GSI EXCEEDENCES IN COMPLIANCE AND SENTINEL WELLS and RESPONSE ACTIONS
CHEMCENTRAL, WYOMING, MI

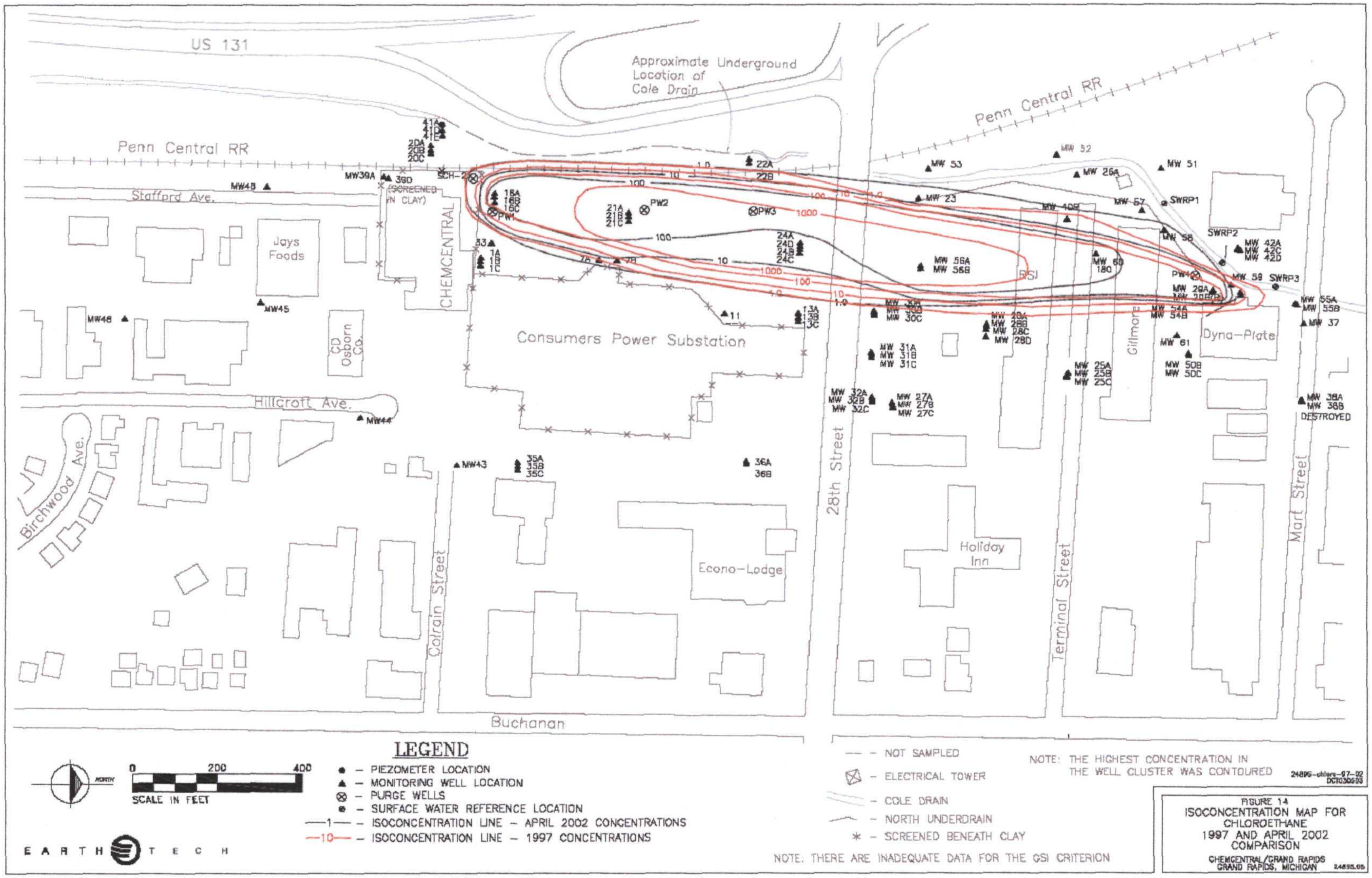
Date	Well	Parameter > GSI (Criterion)	Result Date	Resample Result Date	Subsequent Quarterly Result	Action
10/12/00	MW-54B (Compliance)	Vinyl Chloide (15 ug/L)	76 ug/L 10/12/2000	58 ug/L 11/11/00	<1 ug/L	Reported findings in 12/08/00 November Progress Report; committed to schedule of response activities in next quarterly monitoring report. A Mixing Zone Analysis was initiated. Fourth Quarter, 2000 Monitoring Report discussed variability of results and proposed continued monitoring. 3/12/01 letter from EPA to CHEMCENTRAL stated, "both MDEQ and U.S. EPA agree that it is appropriate to continue to monitor MW-54B for vinyl chloride before conducting a Mixing Zone Analysis."
01/09/01	MW-29A (Sentinel)	Vinyl Chloride (15 ug/L)	33 ug/L 1/9/2001	2.3 ug/L 2/14/2001	6.3 ug/L	No action taken due to apparent similarity to variable ground water quality at MW-54B.
01/10/01	MW-58 (Compliance)	Vinyl Chloride (15 ug/L)	20 ug/L 1/10/2001	<1 ug/L 2/14/2001	<1 ug/L	No action taken due to apparent similarity to variable ground water quality at MW-54B.
04/03/01	MW-54B (Compliance)	Vinyl Chloride (15 ug/L)	210 ug/L 4/3/2001	220 ug/L 5/4/2001	<1 ug/L	Although not required by the Plume Dynamics and GSI Groundwater Monitoring Plan because three consecutive exceedances had not occurred, CHEMCENTRAL undertook an evaluation of remedial alternatives to address the sporadic occurrences of vinyl chloride at the GSI. In a June 25 letter to EPA, CHEMCENTRAL proposed to inject ORC® along a 220' line upgradient of the GSI, this letter also proposed monthly sampling at MW-54B for 12 months. In a 7/23/2001 conference call between CHEMCENTRAL, US EPA and MDEQ, the ORC® proposal was tabled and an alternative course of action agreed to. (1) The subsequent evaluation determined that the sporadic GSI exceedances were due to cessation of pumping from the North Underdrain when the air stripper was out of service. Modifications were made in January, 2002 to permit pumping from the North Underdrain when the air stripper was out of service. There have been no GSI exceedances in MW-54B in 9 consecutive quarters since May 2001.
07/11/01	MW-60 (Sentinel)	Vinyl Chloride (15 ug/L)	20 ug/L 7/11/2001	None	<1 ug/L	No action taken pending the results of the ongoing assessment of the interaction of ground water and surface water quality.
07/12/01	MW-29A (Sentinel)	Vinyl Chloride (15 ug/L)	110 ug/L 7/12/2001	None	<1 ug/L	No action taken pending the results of the ongoing assessment of the interaction of ground water and surface water quality.
01/25/02	MW-57 (Compliance)	Bis(2-ethylhexyl)-phthalate (32 ug/L)	40 ug/L 1/25/2002	<5 ug/L 02/20/02	<5 ug/L	No action taken because the concentration was not detected in the resample and in the subsequent quarterly monitoring event. Posssible lab contamination.
1/14/04	PW-4	Ethylbenzene (18 ug/L), Toluene (140 ug/L), Xylene (35 ug/L)	19 ug/L, 270 ug/L, 110 ug/L 4/14/04	<1 ug/L, 1.1 ug/L, <3 ug/L 5/18/04	-	No action taken because PW-4 is part of the remediation system and the concentrations were not detected in the resample.

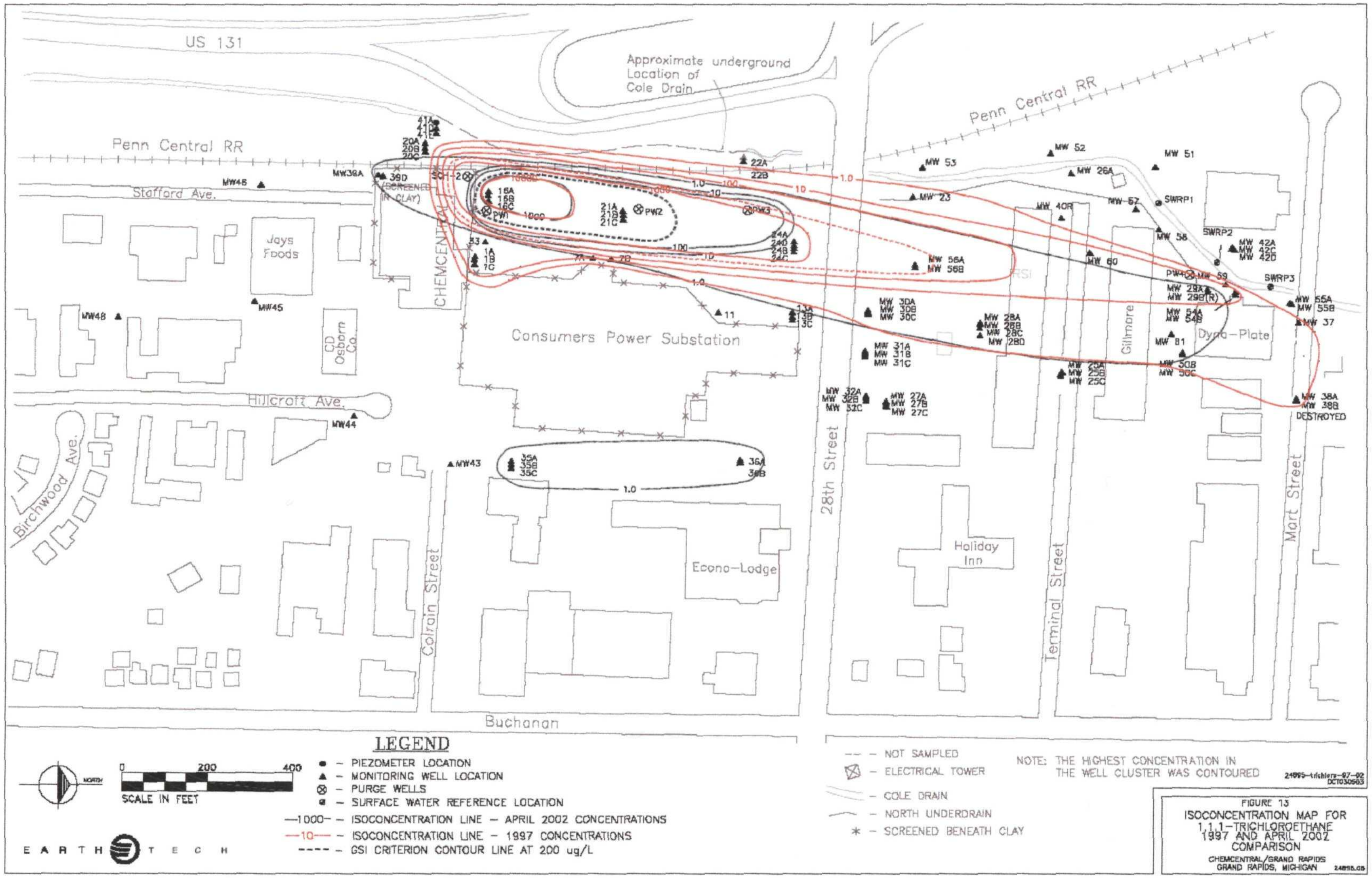
(1) July 23, 2001 Conference call.

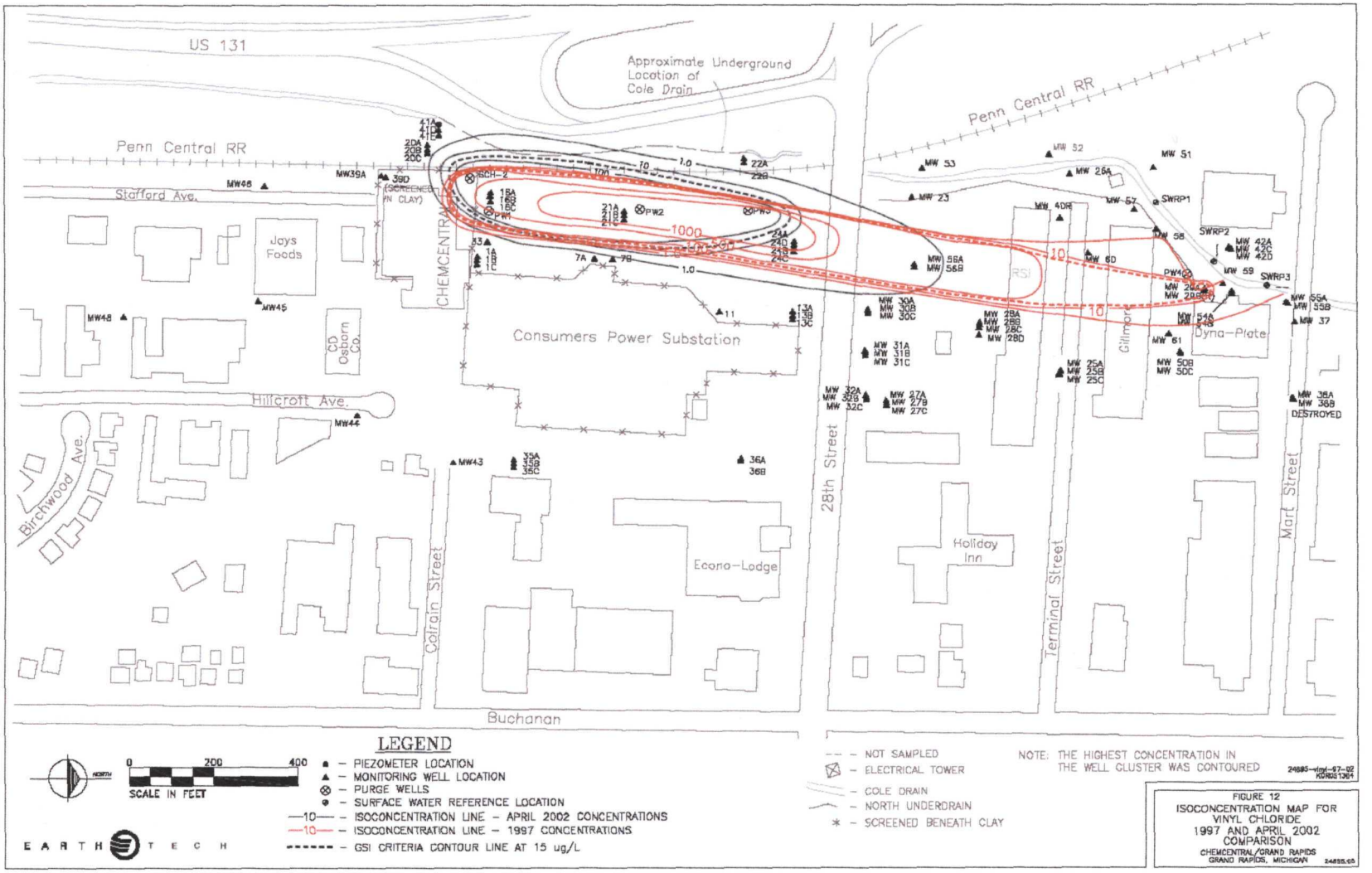
Resolved: (i) ORC proposal tabled. (ii) Mixing Zone Determination optional at this time. (iii) Better understanding of ground water/ suface water system necessary (iv) Monitor MW-54B monthly for 12 months.

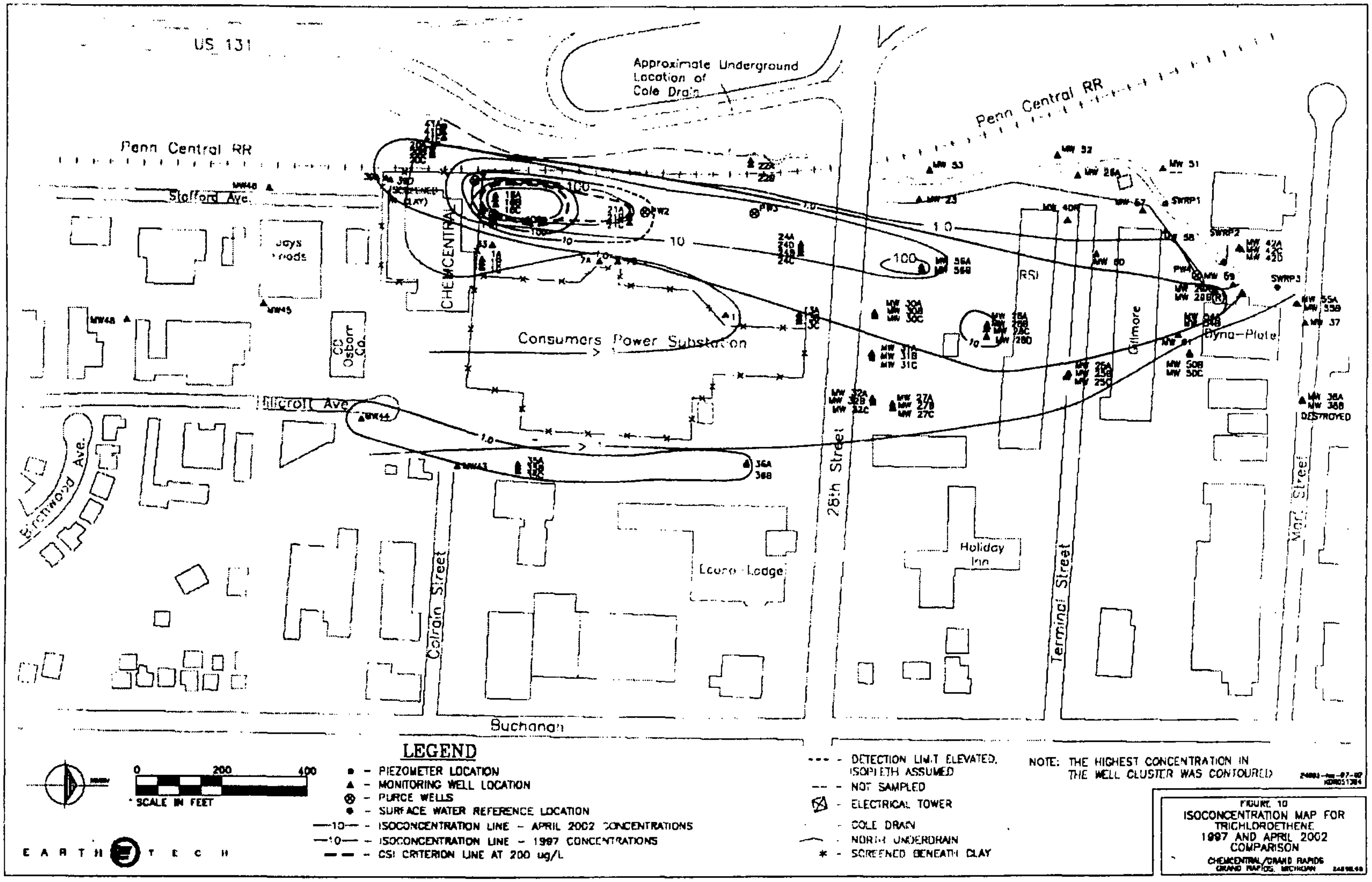
Proposed Action Plan: 1) Evaluate groundwater quality variability. 2) Evaluate potential alternate sources. 3) Evaluate capacity to treat additional groundwater

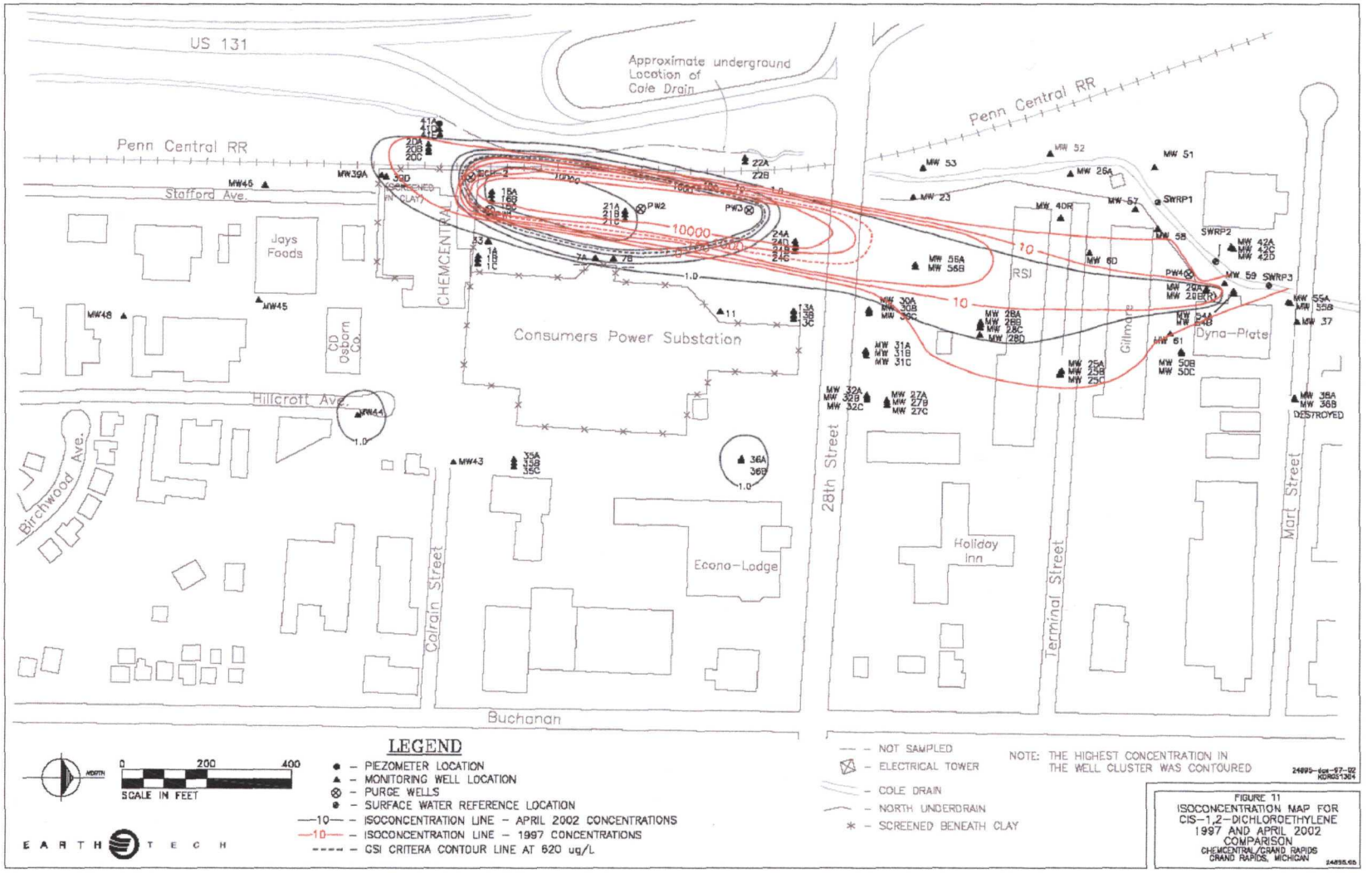
Attachment 8 Plume Maps


US 131
Approximate Underground Location of Cole Drain
Penn Central RR
Penn Central RR
Stafford Ave.
Jays Foods
CHEMCENTRAL
CD Osborn Co.
Consumers Power Substation
Hillcroft Ave.
Birchwood Ave.
Colrain Street
28th Street
Terminal Street
Gillmore
Mart Street
Dyna-Plate
RSI
Holiday Inn
Econo-Lodge
Buchanan
LEGEND
● – PIEZOMETER LOCATION
▲ – MONITORING WELL LOCATION
⊗ – PURGE WELLS
● – SURFACE WATER REFERENCE LOCATION
—1— – ISOCONCENTRATION LINE – APRIL 2002 CONCENTRATIONS
—10— – ISOCONCENTRATION LINE – 1997 CONCENTRATIONS
– – NOT SAMPLED
– ELECTRICAL TOWER
– COLE DRAIN
– NORTH UNDERDRAIN
* – SCREENED BENEATH CLAY
NOTE: THERE ARE INADEQUATE DATA FOR THE GSI CRITERION
NOTE: THE HIGHEST CONCENTRATION IN THE WELL CLUSTER WAS CONTOURED
0 200 400
SCALE IN FEET
NORTH
EARTH TECH
FIGURE 14
ISOCONCENTRATION MAP FOR CHLOROETHANE
1997 AND APRIL 2002 COMPARISON
CHEMCENTRAL/GRAND RAPIDS
GRAND RAPIDS, MICHIGAN


US 131
Approximate underground Location of Cole Drain
Penn Central RR
Penn Central RR
Stafford Ave.
Jays Foods
CHEMCENTRAL
Consumers Power Substation
CD Osborn Co.
Hillcroft Ave.
Birchwood Ave.
Colrain Street
28th Street
Terminal Street
Gilmore
Mart Street
Dyno-Plate
Holiday Inn
Econo-Lodge
Buchanan
LEGEND
SCALE IN FEET
0 200 400
NORTH
● – PIEZOMETER LOCATION
▲ – MONITORING WELL LOCATION
⊗ – PURGE WELLS
– SURFACE WATER REFERENCE LOCATION
—1000— – ISOCONCENTRATION LINE – APRIL 2002 CONCENTRATIONS
—10— – ISOCONCENTRATION LINE – 1997 CONCENTRATIONS
---- – GSI CRITERION CONTOUR LINE AT 200 ug/L
– – NOT SAMPLED
– ELECTRICAL TOWER
– COLE DRAIN
– NORTH UNDERDRAIN
* – SCREENED BENEATH CLAY
NOTE: THE HIGHEST CONCENTRATION IN THE WELL CLUSTER WAS CONTOURED
24895-trichlors-97-02
DCT030503
EARTH TECH
FIGURE 13
ISOCONCENTRATION MAP FOR 1,1,1-TRICHLOROETHANE 1997 AND APRIL 2002 COMPARISON
CHEMCENTRAL/GRAND RAPIDS
GRAND RAPIDS, MICHIGAN
24895.05


US 131
Approximate Underground Location of Cole Drain
Penn Central RR
Penn Central RR
Stafford Ave.
Jays Foods
CD Osborn Co.
CHEMCENTRAL
Consumers Power Substation
Hillcroft Ave.
Birchwood Ave.
Calrain Street
Econo-Lodge
28th Street
Holiday Inn
Terminal Street
Gillmore
Dyna-Plate
Mart Street
Buchanan
RSI
1000
10
1.0
LEGEND
SCALE IN FEET
0
200
400
NORTH
PIEZOMETER LOCATION
MONITORING WELL LOCATION
PURGE WELLS
SURFACE WATER REFERENCE LOCATION
ISOCONCENTRATION LINE - APRIL 2002 CONCENTRATIONS
ISOCONCENTRATION LINE - 1997 CONCENTRATIONS
GSI CRITERIA CONTOUR LINE AT 15 ug/L
NOT SAMPLED
ELECTRICAL TOWER
COLE DRAIN
NORTH UNDERDRAIN
SCREENED BENEATH CLAY
NOTE: THE HIGHEST CONCENTRATION IN THE WELL CLUSTER WAS CONTOURED
EARTH TECH
FIGURE 12
ISOCONCENTRATION MAP FOR VINYL CHLORIDE
1997 AND APRIL 2002 COMPARISON
CHEMCENTRAL/GRAND RAPIDS
GRAND RAPIDS, MICHIGAN
24655.05


US 131
Approximate Underground Location of Cole Drain
Penn Central RR
Penn Central RR
Stafford Ave.
CHEMCENTRAL
Consumers Power Substation
Hillcroft Ave.
Birchwood Ave.
Colrain Street
28th Street
Terminal Street
Gilmore
Mart Street
Buchanan
RSI
Dyna-Plate
Holiday Inn
Econo Lodge
LEGEND
PIEZOMETER LOCATION
MONITORING WELL LOCATION
PURGE WELLS
SURFACE WATER REFERENCE LOCATION
ISOCONCENTRATION LINE - APRIL 2002 CONCENTRATIONS
ISOCONCENTRATION LINE - 1997 CONCENTRATIONS
CSI CRITERION LINE AT 200 ug/L
DETECTION LIMIT ELEVATED, ISOPLETH ASSUMED
NOT SAMPLED
ELECTRICAL TOWER
COLE DRAIN
NORTH UNDERDRAIN
SCREENED BENEATH CLAY
SCALE IN FEET
0 200 400
NOTE: THE HIGHEST CONCENTRATION IN THE WELL CLUSTER WAS CONTOURED
EARTH TECH
FIGURE 10
ISOCONCENTRATION MAP FOR TRICHLOROETHENE 1997 AND APRIL 2002 COMPARISON
CHEMCENTRAL/GRAND RAPIDS
GRAND RAPIDS, MICHIGAN


US 131
Approximate underground Location of Cole Drain
Penn Central RR
Penn Central RR
Stafford Ave.
Jays Foods
CHEMCENTRAL
CD Osborn Co.
Consumers Power Substation
Hillcrest Ave.
Birchwood Ave.
Colrain Street
Econo-Lodge
Buchanan
28th Street
Holiday Inn
Terminal Street
RSI
Gilmore
Dyna-Plate
Mart Street
10000
10
1.0
LEGEND
0 200 400
SCALE IN FEET
● – PIEZOMETER LOCATION
▲ – MONITORING WELL LOCATION
⊗ – PURGE WELLS
● – SURFACE WATER REFERENCE LOCATION
—10— – ISOCONCENTRATION LINE – APRIL 2002 CONCENTRATIONS
—10— – ISOCONCENTRATION LINE – 1997 CONCENTRATIONS
---- – GSI CRITERA CONTOUR LINE AT 620 ug/L
– – NOT SAMPLED
– ELECTRICAL TOWER
– COLE DRAIN
– NORTH UNDERDRAIN
* – SCREENED BENEATH CLAY
NOTE: THE HIGHEST CONCENTRATION IN THE WELL CLUSTER WAS CONTOURED
EARTH TECH
FIGURE 11
ISOCONCENTRATION MAP FOR CIS-1,2-DICHLOROETHYLENE 1997 AND APRIL 2002 COMPARISON
CHEMCENTRAL/GRAND RAPIDS
GRAND RAPIDS, MICHIGAN

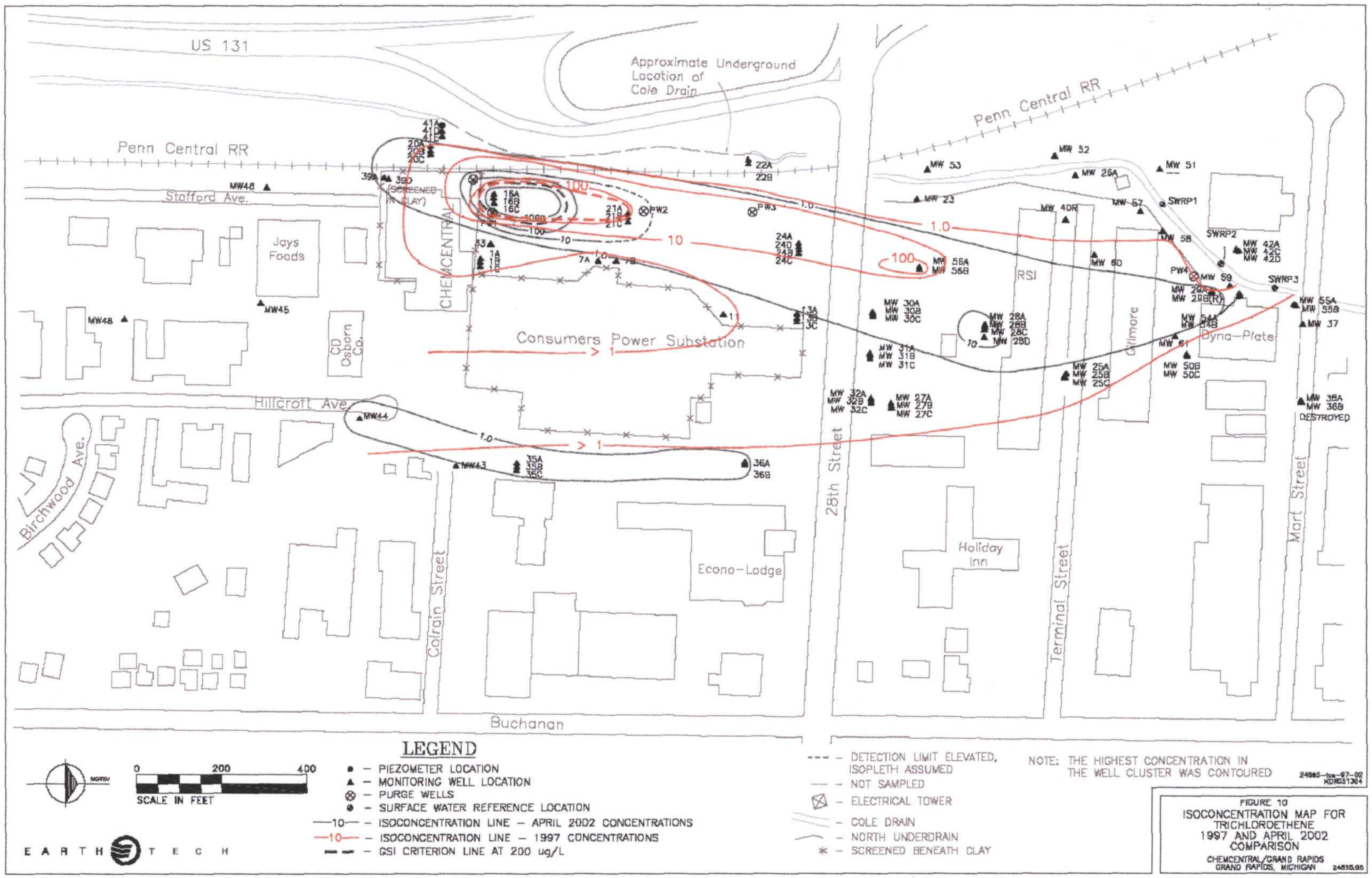
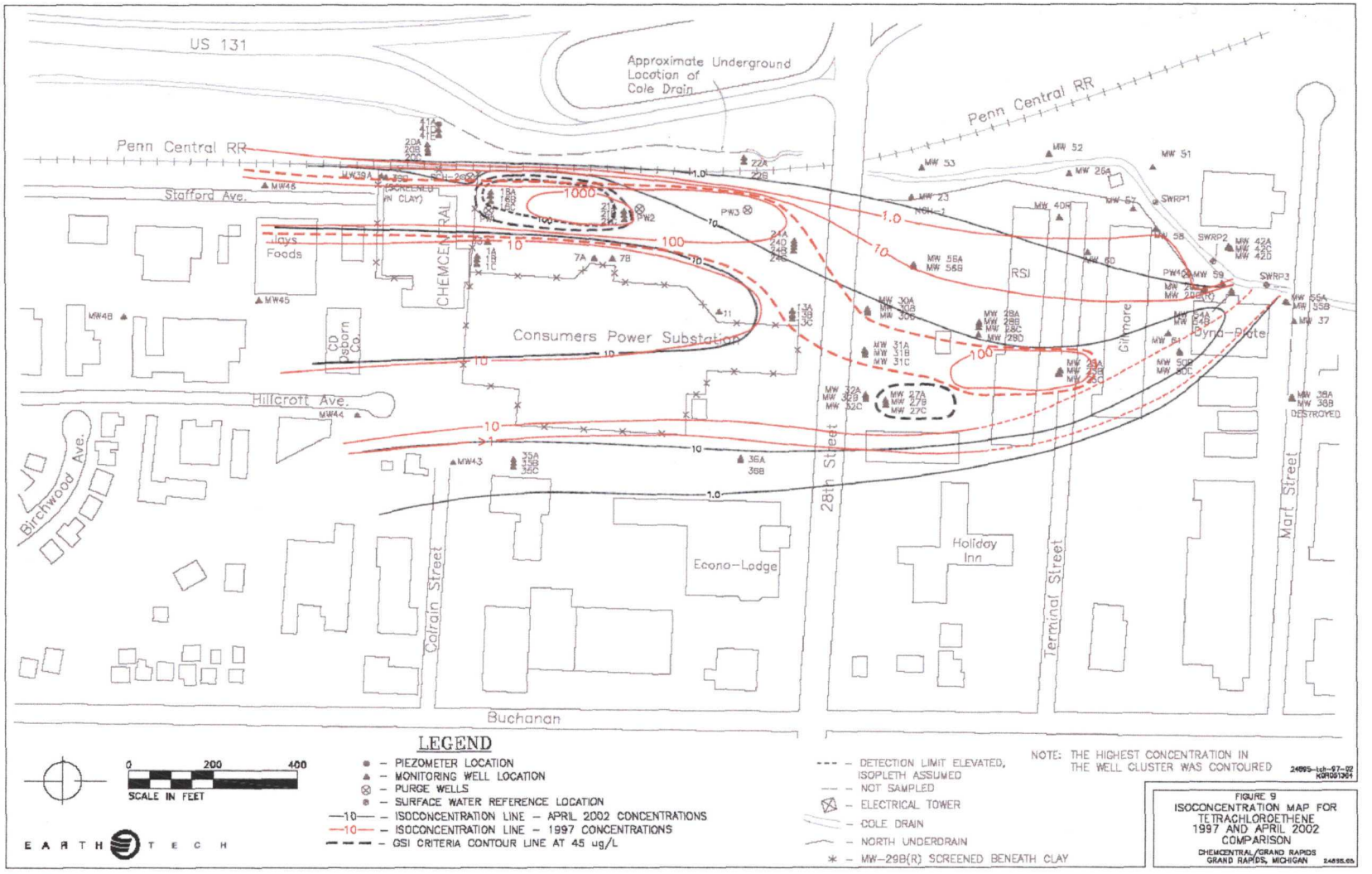

US 131
Approximate Underground Location of Cole Drain
Penn Central RR
Penn Central RR
Stafford Ave.
Jays Foods
CHEMCENTRAL
Consumers Power Substation
CD Osborn Co.
Hillcroft Ave.
Birchwood Ave.
Colrain Street
Econo-Lodge
28th Street
Holiday Inn
Terminal Street
RSI
Gilmore
Dyna-Plate
Mart Street
Buchanan
MW48
MW45
MW44
MW43
MW 53
MW 52
MW 51
MW 23
MW 26A
MW 57
MW 40R
MW 58
MW 59
MW 60
MW 55A
MW 55B
MW 56A
MW 56B
MW 37
MW 36A
MW 36B
DESTROYED
SWRP1
SWRP2
SWRP3
PW2
PW3
PW4
DETECTION LIMIT ELEVATED, ISOPLETH ASSUMED
NOT SAMPLED
ELECTRICAL TOWER
COLE DRAIN
NORTH UNDERDRAIN
SCREENED BENEATH CLAY
NOTE: THE HIGHEST CONCENTRATION IN THE WELL CLUSTER WAS CONTOURED
LEGEND
PIEZOMETER LOCATION
MONITORING WELL LOCATION
PURGE WELLS
SURFACE WATER REFERENCE LOCATION
ISOCONCENTRATION LINE – APRIL 2002 CONCENTRATIONS
ISOCONCENTRATION LINE – 1997 CONCENTRATIONS
GSI CRITERION LINE AT 200 ug/L
0 200 400
SCALE IN FEET
NORTH
EARTH TECH

FIGURE 10
ISOCONCENTRATION MAP FOR TRICHLOROETHENE 1997 AND APRIL 2002 COMPARISON
CHEMCENTRAL/GRAND RAPIDS
GRAND RAPIDS, MICHIGAN


US 131
Approximate Underground Location of Cole Drain
Penn Central RR
Penn Central RR
Stafford Ave.
Jays Foods
CHEMCENTRAL
CD Osborn Co.
Consumers Power Substation
Hillcrott Ave.
Birchwood Ave.
Colrain Street
28th Street
Econo-Lodge
Holiday Inn
Terminal Street
Mart Street
RSJ
Gilmore
Dyna-Plate
Buchanan
1000
100
10
1.0
LEGEND
0 200 400
SCALE IN FEET
EARTH TECH
– PIEZOMETER LOCATION
– MONITORING WELL LOCATION
– PURGE WELLS
– SURFACE WATER REFERENCE LOCATION
–10– – ISOCONCENTRATION LINE – APRIL 2002 CONCENTRATIONS
–10– – ISOCONCENTRATION LINE – 1997 CONCENTRATIONS
– – – – GSI CRITERIA CONTOUR LINE AT 45 ug/L
– – – – DETECTION LIMIT ELEVATED, ISOPLETH ASSUMED
– – NOT SAMPLED
– ELECTRICAL TOWER
– COLE DRAIN
– NORTH UNDERDRAIN
* – MW-29B(R) SCREENED BENEATH CLAY
NOTE: THE HIGHEST CONCENTRATION IN THE WELL CLUSTER WAS CONTOURED
FIGURE 9
ISOCONCENTRATION MAP FOR TETRACHLOROETHENE 1997 AND APRIL 2002 COMPARISON
CHEMCENTRAL/GRAND RAPIDS GRAND RAPIDS, MICHIGAN

Attachment 9

Applicable or Relevant and Appropriate Requirements				
Federal ARARs				
Authority	**ARAR**	**Status**	**Requirement Synopsis**	**Action to be taken to Attain ARAR**
RCRA	40 CFR 262	Applicable	Regulations for hazardous waste generators	ARAR for any site materials shipped off-site for treatment storage or disposal
RCRA	40 CFR 263	Applicable	Department of Transportation Hazardous Materials Transportation Act	ARAR for any shipment of hazardous materials
RCRA	40 CFR 264, Subpart D	Applicable	Contingency Plan and Emergency Procedures	Technical requirements are ARARs for the on-site treatment of soils to minimize hazards to human health and the environment
RCRA	40 CFR 264, Subpart E	Applicable	Manifest system, recordkeeping and reporting	Requires written records of waste management operations. An ARAR if hazardous wastes are shipped to a RCRA facility
RCRA	40 CFR 268	Applicable	Land disposal restrictions	Disposal of treatment residuals and contaminated oil must be in accordance with the land disposal restrictions.
OSHA	40 CFR 300.38	Applicable	Worker safety	Establishes safety and health standards for protecting employees from unsafe work conditions.

Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
TSCA	15 USC 2601		Requires testing and use restrictions for PCBs	All materials contaminated with PCBs will be handled in accordance with these regulations
TSCA	40 CFR 761.60	Applicable	PCB storage areas, storage items, and transport equipment must be marked with the ML mark.	All storage areas, drums, and equipment used for PCB contaminated soils will be labelled appropriately
SDWA	42 USC. 300 Part 141	Applicable	Establishes National Primary Drinking Water standards MCLs	Groundwater will be remediated to achieve MCLs or more stringent state standards.
CWA	40 CFR 403.5	Applicable	POTW pretreatment standards	Groundwater will be treated prior to discharge to the POTW.
CAA	42 USC 1857; 40 USC 52, R52.21; 40 CFR Part 50	Applicable	Regulations on approval and promulgation of implementation plans. All air emissions are required to meet National Ambient Air Quality Standards	The best available control technology will be used prior to disharging to the atmoshphere
ESA	50 CFR Part 200	Applicable	Requires proposed actions minimize effects on endangered species	If endangered species, or critical habitat are encountered mitigtion measures will be employed.
RCRA	40 CFR 261	Applicable	Specifies the characteristics of hazardous waste (CHW)	Solid wastes generated from on-site activities must be evaluated for CHW prior to disposal or treatment.

State ARARs - Note: NREPA refers to Michigan's PA451, as amended, 1994, the Natural Resources and Environemental Protection Act

Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
NREPA	Part 55	Applicable	Outlines permitting requirements to install, construct, reconstruct, relocate, or alter any process, fuelburning equipment, or control equipment which may be a source of an air contaminant.	Only substantive provisions contained in these regulations are required for on-site activities.
NREPA	Part 55	Applicable	Outlines requirements for prohibiting emission of air contaminants of water vapors in quantities that cause, alone or in reaction with other air contaminants, either of the following: (a) Injurious effects to human health or safety, animal life, plant life of significant economic value or property; (b) Unreasonable interference with comfortable enjoyment of life and property.	Actions required by EPA to limit emissions from onsite units or activities that will adversely affect ambient air quality.
NREPA	Part 31	Relevant and Appropriate	Outlines general requirements for management of hazardous waste facilities in Michigan	During the implementation of any site activities, these requirements will be considered and followed when appropriate. Generally, they are expected to be relevant and appropriate to the same extent as the RCRA standards.
Public Act 245	Part 4, Rule 57, 98, and 234	Relevant and Appropriate	Prohibits concentrations in surface water for substances which impart unpalatable flavor to food, fish, or otherwise interfere with the reasonable use of the surface waters of the state	Groundwater will be remediated to standards which are protective of the surface waters

Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
NREPA	Part 55, formerly Public Act 348	Applicable	Outlines permitting requirements to install, construct, reconstruct, relocate, or alter any process, fuelburning equipment, or control equipment which may be a source of an air contaminant.	Only substantive provisions contained in these regulations are required for on-site activities.
MSDWA	Public Act 399	Relevant and Appropriate		
NREPA	Part 31	Relevant and Appropriate	Outlines the rules to protect the public health and welfare and to maintain the quality of groundwater in all usable aquifers for individual, public, industrial, and agricultural water supplies.	Actions required to maintain quality of the groundwater
NREPA	Part 201, formerly Act 307	Relevant and Appropriate	Presents the substantive criteria and procedures for evaluating cleanup of CERCLA type hazardous waste sites in Michigan.	The substantive criteria for establishing cleanup standards and remedial action activities at the site
Michigan Act 451	Part 201, Rule 719(3)	Applicable	Rule requires restrictive covenants to be placed on the site	Appropriate restrictive covenants are to be placed on all affected parcels

Attachment 10 Deed Restrictions

MCSHANE & BOWIE

ATTORNEYS

540 Old Kent Building
P.O. Box 360
Grand Rapids, MI 49501-0360

TELEPHONE (616) 774-0641

TELECOPIER (616) 774-2366

JACK M. BOWIE
THOMAS C. SHEARER
DAVID L. SMITH
WILLIAM H. BOWIE
KEITH P. WALKER
TERRY J. MROZ
GARY G. LOVE
JOHN R. GRANT
DAN M. CHALLA
JOHN F. SHAPE
WAYNE P. BRYAN
MICHAEL W. DONOVAN
ETHAN M. POWSNER
DENISE D. TWINNEY

T. GERALD MCSHANE
(1901-1982)

October 20, 1992

Mr. Michael McAteer
Remedial Project Manager
77 West Jackson Blvd.
Chicago, IL 60604-3590

Ms. Sherry L. Estes
Assistant Regional Counsel
77 West Jackson Blvd.
Chicago, IL 60604-3590

Re: Chemcentral Superfund Site

Dear Mr. McAteer and Ms. Estes:

Please find enclosed for your records a copy of the original recorded Deed Restrictions for the Chemcentral Superfund Site, recorded on October 8, 1992 in Liber 3118, Page 101 through 109, Kent County, Michigan records.

Very truly yours,

Paula M. Lewison

Paula M. Lewison
Legal Assistant

PML/kmg

cc: Robert Garner (w/encl)
William Mulliken, Esq. (w/encl)
Louis M. Rundio (w/encl)
Keith P. Walker, Esq.
Dan M. Challa, Esq.

(922940035 - 2 - KMG)

LIBER 3118 PG 101

92 OCT -6 P.M. 1:45

DEED RESTRICTIONS

Chemcentral Corporation, an Illinois corporation, (hereinafter "Owner") of 7050 West 71st Street, P. O. Box 730, Bedford Park, Illinois 60400-0730, hereby imposes restrictions on the Owner's Parcel, as more fully described on attached Exhibit A, which is part of the Chemcentral Superfund Site (hereinafter "Site") in the City of Wyoming, Kent County, in the State of Michigan.

GROUNDWATER PARCEL:

That part of the S 1/2, Section 12, and part of the N 1/2, Section 13, T6N, R12W, City of Wyoming, Kent County, Michigan, described as: BEGINNING at a point on the West line of said NE 1/4, Section 13, and the centerline of Railroad R.O.W. which is 1118.75 feet South of the N 1/4 corner of Section 13; thence Easterly perpendicular to said West line along the South property line of Chem Central property to the Westerly line of Hillcroft Street; thence Northerly along said Westerly line to its intersection with the North line of Colrain Street; thence Easterly along the North line of Colrain Street to its intersection with the Northeasterly line of the former Michigan Railroad R.O.W. (100 feet wide); thence Northwesterly along said Northeasterly line to the South line of the North 660 feet of said NE 1/4, Section 13; thence Easterly along said Southerly line to the Westerly line of Hillcroft Street extended; thence North along said Westerly line to the centerline of Mart Street; thence West along the centerline of Mart Street to the Westerly bank of Cole Drain; thence Southwesterly along the Westerly bank of Cole Drain to its intersection with the Easterly line of Conrail Railroad R.O.W.; thence Westerly parallel with the South line of Section 12 to the centerline of Conrail Railroad R.O.W; thence Southerly along said centerline to the place of beginning.

SOIL PARCEL:

That part of the N 1/2, Section 13, and that part of the S 1/2, Section 12, T6N, R12W, City of Wyoming, Kent County, Michigan, described as: BEGINNING at a point on the West line of said NE 1/4, and the centerline of the Railroad R.O.W. which is 1118.75 feet South from the N 1/4 corner of Section 13; thence Easterly 328.7 feet perpendicular to said West line along the

Southern property line of the Chem Central Corporation property located at 2940 Stafford Avenue; thence Northerly parallel with the West line of said NE 1/4 to a point which is approximately 200 feet North of the Northerly R.O.W. line of 28th Street (to include the entire area encompassed by the "28th Street ditch"); thence Westerly parallel with the North line of said NE 1/4, Section 13 to the Easterly bank of Cole Drain; thence Southerly along the Easterly bank of Cole Drain to its intersection with the Easterly line of Conrail Railroad R.O.W.; thence Westerly parallel with the South line of Section 12 to the centerline of Conrail Railroad R.O.W.; thence Southerly along said centerline to the place of beginning.

The following restrictions are imposed upon the Soil and Groundwater parcels, its present and any further owners, their authorized agents, assigns, employees or persons acting under their direction or control, for the purposes of protecting public health or welfare and the environment, preventing interference with the performance, and the maintenance, of any response actions selected and/or undertaken by the United States Environmental Protection Agency ("US. EPA"), or any party acting as agent for US. EPA, or any party acting pursuant to a Unilateral Administrative Order, an Administrative Order on Consent or Consent Decree with US. EPA pursuant to Sections 104, and 106 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"). Specifically, the following deed restrictions shall apply to the Site as provided for in paragraph thirty-six (36) of the Unilateral Administrative Order dated March 31, 1992, recorded April 30, 1992 in Liber 3027, Pages 954-1059, inclusive, Kent County, Michigan records.

As to the Groundwater Parcel:

1. There shall be no consumptive or other use of the groundwater underlying the GROUNDWATER PARCEL and there shall be no use of the Real Estate described in the GROUNDWATER PARCEL in any manner that could cause exposure of humans or animals to contaminated groundwater in concentrations that present or may present a threat to health (i.e., concentrations above the Cleanup Standards set forth in paragraph 17 of the Unilateral Administrative Order).

As to the Soil Parcel:

1. There shall be no residential use or any further commercial development of the Real Estate described in the SOIL PARCEL that would allow continued presence of humans, other than any presence necessary for implementation of remedial action under the Administrative Order. The prohibited uses shall include, but not be limited to, any filling, grading, excavating, building, construction, drilling, mining, farming, or other development, or placing waste material within the Facility, except with the approval of the United States Environmental Protection Agency ("US. EPA") as consistent with the Administrative Order and the Statement of Work which is Appendix II to the Unilateral Administrative Order.

As to Both Parcels:

1. There shall be no tampering with, or removal of, the containment or monitoring systems that remain on the property affected by these deed restrictions as a result of implementation of any response action by US. EPA, or any party acting as agent for US. EPA, or any party acting pursuant to a Unilateral Administrative Order, Administrative Order on Consent or Consent Decree with US. EPA; provided that the response action is selected and/or undertaken or ordered by US. EPA pursuant to Section 104 and/or Section 106 or CERCLA; and

2. There shall be no use of, or activity at, the property affected by these deed restrictions that may interfere with, damage, or otherwise impair the effectiveness of any response action (or any component thereof) selected and/or undertaken by US. EPA, or any party acting as agent for US. EPA or any party acting pursuant to a Unilateral Administrative Order, Administrative Order on Consent or Consent Decree with US. EPA, pursuant to section 104 and/or Section 106 of CERCLA, except with the written approval of US. EPA, in consultation with the State of Michigan, and consistent with all statutory and regulatory requirements.

3. Pursuant to the Rule 200.5719 of the Michigan Act 307 implementing Rules, the Owner shall install permanent marker on each side of the property restricted under either the soil and/or groundwater restrictions,

which describes the restricted area and the nature of the prohibitions specified in the applicable deed restrictions.

All the above restrictions for the Groundwater Parcel, the Soil Parcel and Both Parcels shall run with the land and be binding upon the owners and their respective successors, assigns and transferees. The restrictions set forth "As To Both Parcels" shall continue in perpetuity. The remaining restrictions shall remain in full force and effect unless and until US. EPA issues a determination in writing or a court of competent jurisdiction rules to either modify or terminate the restrictions in response to a petition from an owner of affected property, as provided below. A copy of these restrictions shall be provided to all respective successors, assigns and transferees.

After all the Soil Vapor Extraction, as defined in the Unilateral Administrative Order, has been completed and upon achievement of Cleanup and Performance Standards, consistent with the Unilateral Administrative Order and the ROD, the affected property owner may petition the Regional Administrator of the US. EPA, Region V, or his delegate, to modify or terminate the deed restrictions set forth "As to the Soil Parcel." Any petition for modification or termination shall state the specific provision sought to be modified or terminated and the proposed additional uses of the property, and shall include a demonstration that the remaining soil contamination does not constitute an unacceptable risk to human health and the environment, as defined by the NCP. Any proposed modifications or terminations must not be inconsistent with the requirements set forth in the ROD, the RD/RA Work Plan, or the UAO.

After all the Work, as defined in the Unilateral Administrative Order, has been completed and upon achievement of Cleanup and Performance Standards, consistent with the Unilateral Administrative Order and the ROD, the affected property owner may petition the Regional Administrator of the US. EPA, Region V, or his delegate, to modify or terminate the deed restrictions set forth "As to the Groundwater Parcel". Any petition for modification or termination shall state the specific provision sought to be modified or terminated and the proposed additional uses of the property. Any proposed modifications or terminations must not be inconsistent with the requirements set forth in the ROD, the RD/RA Work Plan, or the UAO.

The petitioning property owners shall provide ChemCentral Corporation with a copy of any petition for modification or termination of deed restrictions submitted to US. EPA. ChemCentral may object to the proposed use of the property on the grounds that such use may expose humans, animals or plants to soil contaminants remaining at the Site, cause wind dispersal or surface run-off to carry soil contaminants off the Site, or cause migration of contaminants beyond the Site boundaries, or into the groundwater, in excess of the Cleanup Standards as set forth in the SOW and the RD/RA Work plan. Any party so objecting shall notify the owners, the US. EPA, and the State of Michigan in writing, within thirty (30) days of receipt of the proposed modification or termination. The Regional Administrator may allow or deny the owner's petition in whole or in part. Any dispute as to the Regional Administrator's determination is subject to the jurisdiction of the United States District Court for the Western District of Michigan. However, US. EPA reserves its right to argue before the Court for record review and the appropriate standard of review of the Administrator's determination.

If any provision of these Deed Restrictions is held to be invalid by any court of competent jurisdiction, the invalidity of such provision shall not affect the validity of any other provisions hereof. All such other provisions shall continue unimpaired in full force and effect.

If any provision of this Deed Restriction is also the subject of any law or regulations established by any federal, state or local government, the stricter of the two standards shall prevail.

No provision of these Deed Restrictions shall be construed so as to violate any applicable zoning laws, regulations or ordinances. If any such conflict does arise, the applicable zoning laws, regulations or ordinances shall prevail, unless they are inconsistent with CERCLA.

The undersigned persons executing these Deed Restrictions on behalf of the Owner represent and certify that they are duly authorized and have been fully empowered to execute and deliver these Deed Restrictions.

Extension of Deed Restrictions.

These Deed Restrictions may from time to time be extended to incorporate additional real property by the owners of the Soil Parcel and/or Groundwater Parcel at any time by recording an addendum to these Deed Restrictions executed by the owner. With the same formality as these Deed Restrictions adding specifically described portions of the Soil Parcel and/or Groundwater Parcel to the lands burdended by these Deed Restrictions. The appropriate owners, may so extend these Deed Restrictions by referencing the liber and page of these Deed Restrictions and including the legal description of the property within the Soil Parcel and/or Ground Restrictions to be added.

IN WITNESS WHEREOF, the said Owner of the above described property have caused these Deed Restrictions to be executed on this 7th day of October, 1992.

WITNESSES:

Robert J. Garner

Graham Carpio

CHEMCENTRAL CORPORATION,
an Illinois corporation

By: William D. Mulliken
William D. Mulliken
Its: Vice President General Counsel

STATE OF ILLINOIS)
) ss.
COUNTY OF Cook)

The foregoing instrument was acknowledged before me this 7th day of October, 1992, by WILLIAM D. MULLIKEN the V.P. + GEN. COUNSEL of ChemCentral Corporation, an Illinois corporation, on behalf of the corporation.

Grace C. Cruz

Notary Public, Cook County, IL
My Commission Expires: 10/18/92

" OFFICIAL SEAL "
GRACE C. CRUZ
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 10/18/92

Drafted by:
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

with portions drafted by:
Keith P. Walker, Esq.
McShane & Bowie
111 Lyon, N.W., Suite 540
P. O. Box 360
Grand Rapids, MI 49501-0360

Return to Keith P.Walker after recording

(921530048 - 11 - DAJ)

Exhibit A

Parcel 6
CHEMCENTRAL

Tract 1
452-007
Part of Groundwater & Soil Parcel

A parcel of land in the Southwest 1/4 and in the Southeast 1/4 of Section 12, Town 6 North, Range 12 West, City of Wyoming, Kent County, Michigan described as beginning at a point on the South line of Section 12, South 88°58'50" East a distance of 8 feet from the South 1/4 corner of said Section 12; running thence South 88°58'50" East along the South line of said section a distance of 234.61 feet; thence North 19°24'20" West a distance of 585.96 feet to the South line of Terminal Street (so called); thence North 88°58'50" West along the South line of Terminal Street, said South line being 550 feet North of the South line of said section a distance of 197.97 feet to the easterly right-of-way line of the Pennsylvania Railroad; thence Southerly along said Easterly right-of-way line of the Pennsylvania Railroad 575 feet more or less to the Point of Beginning containing (not including existing highway) 2.06 acres of land, more or less, and subject to a right-of-way heretofore conveyed to the State of Michigan across the Southerly 80 feet thereof.

Tract 2
PART 201-025
Part of Groundwater & Soil Parcel

A strip of land 14 feet wide in the West 1/2 of the Northeast 1/4 of Section 13, Town 6 North, Range 12 West, City of Wyoming, Kent County, Michigan, being more particularly described as follows:

Beginning at a point 904.75 feet South and 50 feet East of the North 1/4 corner of said section; running thence East parallel with the North line of said Section 278.7 feet; thence South parallel with the North/South 1/4 line of said Section 14 feet; thence West parallel with the North line of said Section 278.7 feet; thence North parallel with the North/South 1/4 line of said Section 14 feet to the place of beginning.

Tract 3
PART 451-010 and 452-007
Part of Groundwater & Soil Parcel

A parcel of land in the Southwest 1/4 of the Southeast 1/4 of Section 12, Town 6 North, Range 12 West, City of Wyoming, Kent County, Michigan, described as: Commencing at the South 1/4 corner of said Section 12, thence South 88°58'50" East 242.61 feet along the South line of said Section 12, thence North 19°24'20" West 585.96 feet to the South right-of-way line of Terminal Street (so-called) for the place of beginning of this description; thence North 88°58'50" West 71.20 feet along said South right-of-way line of Terminal Street, thence North 7°37'32" East 146.81 feet to the intersection of a line bearing North 19°24'20" West from the place of beginning of this description, thence South 19°24'20" East 155.62 feet to the point of beginning.

Tract 4
Part 201-025
Part of Groundwater & Soil Parcel

The South 358.75 feet of the following description: All that part of West 1/2 of the Northeast 1/4 of Section 13, Town 6 North, Range 12 West, City of Wyoming, Kent County, Michigan described as: commencing 660 feet South and 50 feet East of the North one-quarter corner of said section; thence South parallel with the North and South 1/4 line 458.75 feet to a point 1533 feet North of the East and West one-quarter line of said section; thence East at right angles 485 feet; thence North parallel with said North and South 1/4 line 68.2 feet; thence Northwesterly 440.55 feet to a point 258.45 feet East of the place of beginning; thence West parallel with the North line of said section 258.45 feet to the place of beginning, together with the right of egress and ingress over a strip of land 60 feet in width East and West and lying East of the above described premises, and running thence South to 32nd Street, this being known as Hillcroft Avenue, and also over a strip of land 60 feet in width East and West, and lying East of and adjacent to the Pennsylvania Railroad right-of-way, and running from the South border of said above described premises South to 32nd Street, which right of way, hereby granted, shall be a perpetual easement, binding upon the grantors herein and their heirs, and shall run with the land, subject to encumbrances, easements of record and to be used for highway purposes only, in conjunction with owners of adjacent properties, with permission to maintain, repair, or improve the same at their own expense.

Excepting therefrom the following described property:
The South 358.75 feet of the following description: All that part of the West 1/2 of the Northeast 1/4 of Section 13, Town 6 North, Range 12 West, City of Wyoming, Kent County, Michigan described as: Commencing 660 feet South and 50 feet East of the North one-quarter corner of said section; thence South parallel with the North and South one-quarter line 458.75 feet to a point 1533 feet North of the East and West 1/4 line of said Section; thence East at right angles 485 feet; thence North Parallel with said North and South 1/4 line 68.2 feet; thence Northwesterly 440.55 feet to a point 258.45 feet East of the place of beginning; thence West parallel with the North line of said Section 258.45 feet to the place of beginning, except the South 200 feet of the West 278.7 feet thereof.

(91530041-13J- KAS)

ACKNOWLEDGEMENT

Jacob C. Mol, a married man, and Lois B. Mol, his wife who joins in this acknowledgement for dower purposes, of 3075 Baldwin, Hudsonville, Michigan 49426, as the owner of the Property described in the attached Exhibit "A" which is contained, in whole or in part, within the ChemCentral Superfund Site as ordered by the United States Environmental Protection Agency pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), in Liber 3027, Pages 954 through 1059, and defined in the Deed Restrictions imposed by ChemCentral on the Owner's Site and recorded in Liber 3118, Pages 101 through 109, Kent County, Michigan records ("Deed Restrictions"), hereby acknowledges the Property described in the attached Exhibit "A" is subject to said Deed Restrictions. This Acknowledgement will be attached to the Deed Restrictions and re-recorded with the Kent County Register of Deeds.

Dated this 11 day of December, 1992.

WITNESSES:

Gerard J. Granlyn
* Gerard J. Granlyn

Marcia L. DeBoer
* Marcia L. DeBoer

Jacob C. Mol
Jacob C. Mol

Lois B. Mol
Lois B. Mol

STATE OF MICHIGAN)
) SS.
COUNTY OF Kent)

The foregoing instrument was acknowledged before me this 11th day of December, 1992, by Jacob C. Mol and Lois B. Mol, husband and wife.

Gerard J Granlyn
*

Notary Public, Kent County, MI
My Commission Expires: _____

Notary Public, Kent County, MI
My Commission Expires: May 29, 1996

This Instrument Drafted By:
KEITH P. WALKER, ESQ.
MCSHANE & BOWIE
540 Old Kent Building, P.O. Box 360
Grand Rapids, MI 49501-0360

Return to Draftsman After Recording

*Print or type names underneath signature

(923140018 - 3 - PDS) E

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Parcel 2

Part of Groundwater Parcel

The West 167.76 feet of the East 1042.76 feet of the North 280 feet of the South 1140 feet of the Southwest 1/4 of the Southeast 1/4 of Section 12, Town 6 North, Range 12 West, City of Wyoming, Kent County, Michigan. Subject to and together with a right-of-way for highway purposes over and across a 60 foot wide strip, between the West line of Buchanan Avenue and the East line of the US-131 Expressway right-of-way, the centerline of said 60 foot wide strip being 1140 feet North of and parallel with the South line of the Southeast 1/4 of said Section.

EDC of Wyoming
41-17-12-451-002

(921530041-13K - KAS)

ACKNOWLEDGEMENT

Jacob C. Mol, and Lois B. Mol, his wife who joins in this acknowledgement for dower purposes, of 3075 Baldwin, Hudsonville, Michigan 49426, as the owner of the Property described in the attached Exhibit "A" which is contained, in whole or in part, within the ChemCentral Superfund Site as ordered by the United States Environmental Protection Agency pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), in Liber 3027, Pages 954 through 1059, and defined in the Deed Restrictions imposed by ChemCentral on the Owner's Site and recorded in Liber 3118, Pages 101 through 109, Kent County, Michigan records ("Deed Restrictions"), hereby acknowledges the Property described in the attached Exhibit "A" is subject to said Deed Restrictions. This Acknowledgement will be attached to the Deed Restrictions and re-recorded with the Kent County Register of Deeds.

Dated this 11th day of December, 1992.

WITNESSES:

Gerald J. Gravelyn
* GERALD J. GRAVELYN

Marcia L. DeBoer
* MARCIA L. DEBOER

Jacob C. Mol
Jacob C. Mol

Lois B. Mol
Lois B. Mol

STATE OF MICHIGAN)
) SS.
COUNTY OF KENT)

The foregoing instrument was acknowledged before me this 11th day of December, 1992, by Jacob C. Mol and Lois B. Mol, husband and wife.

Gerald J. Gravelyn
*
Notary Public, Kent County, MI
My Commission Expires: GERALD J. GRAVELYN
Notary Public, Kent County, MI
My Commission Expires May 26, 1996

This Instrument Drafted By:
KEITH P. WALKER, ESQ.
MCSHANE & BOWIE
540 Old Kent Building, P.O. Box 360
Grand Rapids, MI 49501-0360

Return to Draftsman After Recording

*Print or type names underneath signature

(923140018 - 4 - PDS) F

STATE OF MICHIGAN
COUNTY OF KENT
RECEIVED FOR RECORD
92 DEC 18 AM 11:39

Parcel 3

Part of Groundwater Parcel

The West 100 feet of the East 875 feet of the North 280 feet of the South 1140 feet of the West 1/2, of the Southeast 1/4 of Section 12, Town 6 North, Range 12 West, City of Wyoming, Kent County, Michigan subject to and together with an easement for highway purposes over and across the North 60 feet of the South 1170 feet of said West 1/2 of the Southeast 1/4 of Section 12, Town 6 North, Range 12 West

JACOB MOL
41-17-12451-003

(921530041-13F-KAS)

CHEMCENTRAL SUPERFUND SITE
PROGRESS REPORT
March 23, 2004

PARCEL 1
H & H MANAGEMENT & DEVELOPMENT, CO, OWNER

November 12, 1992	Letter from McShane & Bowie to Parcel Owner with acknowledgment form
December 1, 1992	Letter from McShane & Bowie to Henry Pestka with copy of the United States Environmental Protection Agency CHEMCENTRAL Corporation Unilateral Administrative Order.
May 3, 1993	Dan M. Challa and Paula M. Lewison met with David E. Preston, Attorney at Varnum, Riddering, Schmidt & Howlett, counsel to Henry Pestka and Henry Pestka's son regarding parcel 1.
May 5, 1993	Correspondence to David E. Preston enclosing a survey of the CHEMCENTRAL Superfund site, providing the name of the engineers for the remediation plan and contact person for the remediation plan who was on vacation until May 11, 1993. David Preston was authorized to receive information from WW Engineering & Science and invited to obtain any further information he felt necessary.
May 12, 1993	Provided Craig Vandenberg at WW Engineering & Science a copy of the survey for Parcel 1 so that he could discuss the remediation plans with David Preston.
August 5, 1993	Received a telephone call from David Preston re: questions regarding description of contaminated property and appraisal of property.
October 4, 1993	Received a letter from David Preston, Varnum, Riddering, Schmidt & Howlett requesting a legal description of the Parcel 1 property located within the Superfund site and requested and appraisal of the value of the property. Mr. Preston also requested that CHEMCENTRAL pay the reasonable cost of an appraisal and that the procedure to obtain an appraisal of the value of the property be discussed between himself and Dan Challa of our office.
October 13, 1993	Dan Challa talked with appraiser Tom Blandford re: appraisal of the property.

October 13, 1993	Letter from McShane & Bowie to Colleen Hart requesting modification of legal description for deed restrictions.
October 22, 1993	A letter to Mr. David E. Preston from McShane & Bowie providing him with a survey and legal description of the portion of Parcel 1 within the Superfund site.
November 24, 1993	Dan Challa met with the appraiser, Tom Blandford.
December 10, 1993	Letter to Colleen Hart with legal description of Parcel 1. We are waiting for the EPA to approve legal description and David Preston to approve Tom Blandford's recommendation.
April 14, 1994	Meeting occurred in the office of the Environmental Protection Agency in Chicago. It was agreed at that meeting that CHEMCENTRAL would proceed to obtain a written appraisal with respect to the triangular parcel of property which is the portion of Parcel 1 within the boundaries of the Superfund Site.
October 19, 1994	Appraisals for Parcels 1 and 4 were sent to Sherry Estes of EPA for review
April 5, 1995	A written offer was made to Mr. Pestka, the owner of Parcel 1, for the purchase of the triangular parcel of property for the sum of $7,600.
June 24, 1999	Letter from Daniel H. Brennan of CHEMCENTRAL to Tom Pohlman II of H & H Management & Development Co., submitting revised offer to purchase triangular parcel for $10,395.
June 30, 1999	Letter from Dan Brennan at CHEMCENTRAL to McShane & Bowie indicating that CHEMCENTRAL was waiting to receive a signed sales contract from Mr. Pestka with respect to the triangular parcel and that the purchase agreement would be forwarded to our office when it was received.
November 21, 2003	Parcel 1 conveyed to H & H Management & Development Co.

PARCEL 2 AND PARCEL 3
JACOB C. MOL, OWNER

Acknowledgment signed and recorded

PARCEL 4
JOHN F. GILMORE, L.L.C., OWNER

November 12, 1992	Letter from McShane & Bowie to Parcel Owner with Acknowledgment form.
December 31, 1992	Letter from McShane & Bowie to Baker, Knapp & Tubbs, Inc. requesting they review our November 12, 1992 correspondence requesting that they sign the Acknowledgment.
January 4, 1993	Letter returned - no forwarding address.
February 26, 1993	Letter from Paul H. TenPas, attorney stating that Baker, Knapp & Tubbs would sell the property to CHEMCENTRAL for $1 million dollars.
March 20, 1993	Requested title search from Transamerica Title Insurance Company to verify title is in Mastercraft Furniture Company of Grand Rapids, a Michigan corporation and checked with the Michigan Corporation & Securities Bureau to find that Mastercraft Furniture Company of Grand Rapids has been dissolved.
March 17, 1993	Letter from CHEMCENTRAL to Paul H. TenPas requesting the appraisal of the property prepared by MAI and requesting environmental assessment re: groundwater analysis
March 26, 1993	Letter from Paul TenPas to CHEMCENTRAL enclosing a copy of the appraisal showing that the property had a fair market value of $850,000.00. Letter stated that he did not understand why an environmental assessment was needed since CHEMCENTRAL had the results of tests performed in conjunction with the remedial investigation and further stated that if CHEMCENTRAL felt it needed additional information, Baker would make arrangements for CHEMCENTRAL to conduct further on-site testing.
April 13, 1993	Letter from McShane & Bowie to client with title search. The letter further reports that there is no recorded documentation showing how Baker, Knapp & Tubbs and/or Kohler obtained any interest in the property report that City of Wyoming shows the owner as Baker, Knapp & Tubbs and the current taxpayer as Kohler. Although we have no proof that either company recorded documents showing a real property interest.

April 22, 1993	Letter from CHEMCENTRAL to Paul H. TenPas thanking Mr. TenPas for forwarding the appraisal and explaining that the need for the environmental assessment because CHEMCENTRAL's investigation was comprehensive, but did not focus on specific down gradient properties nor did it attempt to locate other contributing sources of contamination and as a result, CHEMCENTRAL had no direct information regarding groundwater or soil conditions on the property. CHEMCENTRAL offered to share the cost of a groundwater assessment on a 50-50 basis.
March 3, 1994	No word from TenPas. No change in title from Mastercraft to show interest of Baker, Knapp or Tubbs or Kohler.
March 10, 1994	Letter to TenPas asking for reply. Copy attached.
April 14, 1994	At the meeting in the offices of the Environmental Protection Agency in Chicago, it was agreed that CHEMCENTRAL would make a monetary offer to Kohler, the supposed owner of Parcel 4, within 6 weeks after the date of the meeting. The offer would be based upon the appraised value of an underground utility easement across Parcel 4. The offer was to be made after the EPA agreed that the amount of the offer based upon the appraised value of a underground utility easement would constitute CHEMCENTRAL's best efforts at obtaining acknowledgement of the restrictive covenants, in the event that the owner of Parcel 4 rejected the offer.
October 19, 1994	Appraisals for Parcels 1 and 4 were sent to Sherry Estes of EPA for review.
April 5, 1995	Letter from McShane & Bowie to Elizabeth Murphy of EPA asking for confirmation that offer to be made on the basis of the appraisal would constitute "best efforts." No further action was taken because the EPA never provided a written confirmation that the making of such offer would constitute best efforts on behalf of CHEMCENTRAL.
December 21, 1995	Parcel 4 was conveyed to John F. Gilmore, L.L.C.

PARCEL 5
CIAPARA LAND COMPANY, L.L.C., OWNER

November 12, 1992	Letter to owner requesting Acknowledgment.

November 25, 1992	Letter from McShane & Bowie to Michael B. Ortega, attorney Miller, Canfield, Paddock & Stone sending him a copy of the Unilateral Administrative Order.
March 11, 1993	Letter from McShane & Bowie to Mr. Michael Ortega requesting the Acknowledgment to be returned and stating that CHEMCENTRAL is prepared to pay reasonable legal and administrative costs which Ciapara has incurred in connection with the review of our request for the Acknowledgment and restrictions and asking to let us know what those expenses are so that our client could reimburse them.
November 10, 1993	Letter from Richard A. Gaffen, Miller, Canfield, Paddock & Stone requesting that CHEMCENTRAL compensate RSI Wholesale (who appears to be the tenant and presumed to be Mr. Ciapara's Company) of Grand Rapids for the monitoring wells previously placed on the property and payment of a reasonable amount of money in consideration of the deed restrictions placed on the property.
December 8, 1993	Letter from McShane & Bowie to Mr. Richard Gaffen proposing settlement. No response from Mr. Gaffen
April 14, 1994	At a meeting with the EPA in Chicago, it was agreed that the monetary offer would be made to the owner of Parcel 5 within 6 weeks after the date of the meeting. The offer was to be made on the same basis as the offer to Kohler with respect to Parcel 4. At the meeting the EPA agreed that it would consider CHEMCENTRAL to have used its best efforts if such an offer was made and the owner of Parcel 5 rejected or ignored the offer.
March 10, 1995	Letter from McShane & Bowie to Bob Garner of CHEMCENTRAL indicating that Elizabeth Murphy of the Environmental Protection Agency asked us to wait on obtaining the appraisal for the value of an underground utility easement over Parcel 5 until we had submitted the offers on Parcels 1 and 4.
April 5, 1995	Letter from McShane & Bowie to Elizabeth Murphy of EPA asking for confirmation that offer to be made on the basis of the appraisal would constitute "best efforts." No such confirmation was received.

PARCEL 6
CHEMCENTRAL, OWNER

Consent and Acknowledgment recorded.

PARCEL 7
STATE OF MICHIGAN, OWNER

November 12, 1992	Request made for Acknowledgment to the Deed of Restrictions.
December 31, 1992	Letter from McShane & Bowie to Michigan Department of Transportation re: second request to respond to our request for the Acknowledgment.
January 3, 1993	Faxed to Eric Eggan at Attorney General Frank Kelly's office providing him the name of the U.S. EPA contact, Mr. Michael McAteer.
January 13, 1993	Letter from McShane & Bowie to Eric Eggan with a copy of the Unilateral Administrative Order.
January 22, 1993	Letter from Eric Eggan, Assistant Attorney General to Dan Challa requesting fair compensation to the State of Michigan for the deed restrictions and stating that the deed restrictions are too limiting.
February 4, 1993	Letter from McShane & Bowie to Mr. Michael McAteer asking if the deed restrictions can be modified to allow the State of Michigan to provide reasonably safe transportation for all Michigan citizens for maintenance of the road.
March 11, 1993	Letter from McShane & Bowie to Eric Eggan providing Mr. Eggan the name of the EPA contact, Mr. Michael McAteer and advising them that the concerns regarding maintenance of the road were raised with Mr. McAteer who, in concept, has agreed that we could put a qualification on the soils to be disturbed, such that only those soils beneath the specified level below the surface would need prior approval of the EPA. To do this would require amending the EPA order. Mr. McAteer was making various inquiries as to the acceptability of making this change and the process necessary to accomplish it.

March 11, 1993	Letter from McShane & Bowie to Mr. Michael McAteer re: concerns raised by the Michigan Department of Transportation and Consumers Power regarding disturbances to the soil.
September 30, 1993	Letter from Eric Eggan asking for Mr. McAteer's response to the Department of Transportation request.
October 13, 1993	Letter to Colleen Hart from McShane & Bowie requesting modification of restrictions to allow for excavation to 4 feet below the surface.
November 23, 1993	Approval from the EPA for excavation to 3 feet below the surface.
March 3, 1994	Letter to State of Michigan notifying them of approval for excavation to 3 feet and asking them for the expenses and costs regarding their review of this matter.
April 14, 1994	At the meeting held in the offices of the Environmental Protection Agency in Chicago, it was agreed that the Environmental Protection Agency would revise the Unilateral Order in order to allow excavation to 3 feet below grade level.
Spring 1994 through early 1997	Discussion and correspondence between McShane & Bowie and the Michigan Attorney General's office regarding the need for a permit to conduct remediation activities within the street right-of-way.
Late February, 1997	Raymond O. Howd of the Michigan's Attorney General's office indicated in a telephone conversation with Dan Challa with McShane & Bowie that the State of Michigan may not be legally permitted to impose restrictions upon its property.
May 21, 1997	Letter from McShane & Bowie to Raymond O. Howd of Michigan's Attorney General's office indicating that a permit to do work within the 28th Street road right of way would not be required. That letter also indicated that the Environmental Protection Agency would agree to modify the Unilateral Order to allow excavation work no more than 3 feet below grade. In that same letter, the Attorney General's office was asked to reconsider consenting to the restrictions imposed upon Parcel 7. No response to that letter has been received.

PARCEL 8
CONSUMERS POWER COMPANY, OWNER

There have been numerous contacts with Consumers Power Company regarding its property as monitoring wells are located on the property. Consumers Power Company's problems with signing the Acknowledgment are now down to two issues: 1) the need to maintain the electric lines and transforming equipment located on the property which involves access to and excavation of the surface soils which the EPA has approved to the depth of 3 feet above points B and B on attached map; and, 2) CPC needs to see a copy of the 95% clean-up plan as approved which needs to incorporate EPA revisions.

January 3, 1994	Letter from CHEMCENTRAL to CPC (copy attached)
February 24, 1994	Letter from CPC to CHEMCENTRAL confirming March 10, 1994 meeting between parties.
March 10, 1994	Meeting with CPC. CPC said they are still willing to sign Acknowledgment but need more than three foot excavation to maintain its equipment. A technical report will be prepared to give to EPA to show why they need more than three feet. CPC has agreed to allow further clean-up and monitoring on its property.
April 14, 1994	At the meeting held in the office of the Environmental Protection Agency in Chicago, it was agreed that a meeting would be scheduled between Consumer's Power Company, Environmental Protection Agency, CHEMCENTRAL and WWW Engineering and Science to discuss how the Unilateral Order would have to be modified to allow Consumer's Power Company to service its facilities without interfering with the soil or groundwater contamination or the remediation systems. To date, no such meeting has been scheduled.

PARCEL 9
CONSOLIDATED RAIL COMPANY, OWNER

November 12, 1992	Letter from McShane & Bowie to Consolidated Rail Corporation requesting the signed Acknowledgment.
December 31, 1992	Letter to Consolidated Rail Corporation requesting a signed Acknowledgment.
March 11, 1993	Letter to Consolidated Rail Corporation requesting the signed Acknowledgment with offer to pay expenses.

April 4, 1993	Received a phone call from Mr. Ron Yadrick at Conrail and he asked if Conrail was obligated to respond and said that Conrail is reviewing and will get back with us.
December 10, 1993	Letter to Mr. Ron Yadrick at Consolidated Rail Corporation regarding the results of their review.
March 3, 1994	Letter to Mr. Ron Yadrick at Consolidated Rail Corporation regarding the result of their review.
April 14, 1994	At the meeting held in the offices of the Environmental Protection Agency in Chicago, Illinois, it was agreed that CHEMCENTRAL would make a monetary offer to Conrail, the owner of Parcel 9 on the same basis that offers were to be made to the owners of Parcels 4 and 5. This offer was to be made within 6 weeks of the date of the meeting.
March 10, 1995	Letter from McShane & Bowie to Bob Garner of CHEMCENTRAL indicates that Elizabeth Murphy of EPA requested us to wait on obtaining the appraisal for Parcel 9 until we had submitted offers on Parcels 1 and 4. No offer was submitted on Parcel 4 (see above).
April 5, 1995	Letter from McShane & Bowie to Elizabeth Murphy of EPA asking for confirmation that offer to be made on the basis of the appraisal would constitute "best efforts." No such confirmation was received.

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